

V.4 #25
Aug 28, 1901
877

CURRENT NOTES AND COMMENTS

New York, Aug. 26.—The executive committee of the A. C. A. held a meeting at President Shattuck's office this afternoon to consider the holding of the big international road race. Mr. Moore, of the Pan-American transportation committee, was on hand to explain the difficulties in getting right of way for the Buffalo-Erie race. The A. C. A. executive committee resolved to carry out the road race project and put it through, if even at this late day sanction for the Buffalo-Erie course can be obtained. The committee will, failing that endeavor to get permission to use the triangular course on Long Island, used by the Century Road Club for its record trials. The club is firmly resolved to put the race through in October.

Cannot Race at Newport

And so, after all, the races which the swell residents of Newport expected to run on August 30 can not be conducted on the Ocean drive and, if they are held anywhere, will have to be run on some track, possibly Aquidneck Park. The police commissioners have so declared. At first they decided that they had no right to anticipate an infraction of the law and take steps to prevent it. Later they prepared and forwarded to Mr. Vanderbilt a notice of which the following is a copy:

"We are of the opinion that the resolution of the city council of Newport in relation to the use of certain streets by your association for the purpose of holding races does not contemplate or authorize the speeding of machine in such races beyond the limits allowed by law. We do not, therefore, anticipate that it is your intention to become law breakers by exceeding such limit.

"Nevertheless, as it is commonly reported and believed that some of the machines taking part in the races will exceed, and greatly exceed, the local limit, we feel it but just that the board should notify you that any contemplated violation of the law governing the speed of such vehicles meets with our disapproval, and that we shall take all reasonable steps to enforce the law."

The action of the commissioners is said to have been due to the knowledge that a number of residents of Newport would apply to the courts for an injunction, restraining all parties concerned from conducting the races. On Saturday last 10 owners of property on the drive or near it, made such an application. The case will be heard at Providence, if necessary.

The petition is far-reaching, and not only is the court asked to enjoin William K. Vanderbilt, Jr., and the National Automobile Association, but they even ask that it include the members of the city council individually, the members of the special committee of that body appointed to see that everything will be done properly, and all the signers of the petition which was sent in to the city asking that the racers be allowed the use of the roads.

The petitioners state that the public highways are for the use of the public, and are not intended for sports, and that automobile races on them would be a nuisance. They also state that the action of the city council in granting the use of the roads was in excess of its municipal authority.

The signers to the petition are Professor Alexander Agassiz, Mary L. Huntington, Theodore M. Davis, M. R. B. Auchincloss, William Grosvenor, Sidney Webster, Mary Augusta King, Ethel R. King, John D. Peckham and John Maha. With the exception of the last two, all are wealthy cottagers, who own property on the proposed race course. The last two are farmers, whose places also abut on the roads in question.

The Automobile Club's Position

The failure of the racing association at Newport to carry out its programme will cause general regret. The event would have given still further advertising to the possibilities of the automobile—and the American automobile especially—and so have been beneficial to the industry. But now that it has been made clear that the races can not be held without breaking the law and practically defying the authorities is it not the duty of the Automobile Club of America to

NOTES AND COMMENTS.

withdraw its sanction? Heretofore the club has shown commendable determination not to countenance any event which could be construed as an infraction of the law. It has been scrupulously careful to comply with all the requirements of the authorities in the arrangement for the endurance test. By that course of action it has won the respect of the law-makers and the people. A continuance of that policy will do much to remove the prejudice of the thousands who are at present opposed to automobiles. Departure from it will have the contrary effect. No harm will be done the gentlemen of Newport and a great deal of good will be done to the automobilists of the entire country, by a public announcement of the revocation of the sanction on the ground that the event would be contrary to the spirit of the rules of the club.

The Manufacturers' Association

"There is no reason why builders of the vehicles should allow any beneficiary of the industry to share in the general welfare without contributing thereto. I have every reason to believe that in the absence of your personal suasion with the manufacturers of accessories they will not be disposed to come in."

The quotation is from a letter recently mailed to members of the National Association of Automobile Manufacturers by one of its officials in an endeavor to arouse them to action in the matter of increasing the membership. He explains that every maker of anything which enters into the manufacture of automobiles is eligible to associate membership at a cost of \$15 a year and incloses a list of members so that all other persons may be approached and asked to join.

The trade should have an association. It should be far more representative of the industry as a whole than it is at present, and many men in the trade, doubtless, would be willing to make an effort to increase the membership. The wording above quoted, however, seems unfortunate. Although it can hardly be possible that such was the intention, it has a coercive ring. It has the appearance of advice to active members to refuse business to persons other than members of the association. This, it is quite certain, is not the intention of the gentlemen who are responsible for the working of the association.

When the original request for assistance was mailed to members a few weeks ago a correspondent who represents one of the associate members pointed out, in our correspondents' column, that his concern has no voice whatever in the management. In short, he pointed out, it is taxed without being permitted representation. The officers are elected by and all the voting power is vested in the active members, or, in other words, in the makers of complete vehicles. There are other members who do not consider this quite equitable. Although they would, as a matter of course, defer to the makers of automobiles in nearly all things, it is fitting that they be allowed some representation on the board, even though they be not allowed full voting power. It was whispered, some months ago, that an amendment to the constitution was contemplated which would bring about the change referred to. If the directors have considered such a movement it might be wise to let the fact be known. That action would assist the laudable efforts of the officers to increase the membership before the date of the annual meeting.

The Pan-American Fiasco

The announcement of the abandonment of the Erie-Buffalo 100 mile race, briefly announced in last week's issue, was the culmination of a long line of difficulties which have worried the officers of the Automobile Club of America for a long time, though they have maintained a discreet silence in relation to the matter. Some months ago a committee of the club conferred with the management of the Pan-American exposition relative to a week of automobile events and dates were selected. The club then, as a suitable preliminary, promoted the endurance test, which starts on September 9, and, with the supposed assistance of the Pan-American people, decided to promote the 100 mile race.

Naturally the club looked to the local people to secure the necessary sanction, but as time went by they found that the Pan-American people were doing absolutely nothing in the matter. The result was a conference between a representative of the club and the management, said to have been more or less wordy, the outcome of which was an agreement on the part of the

NOTES AND COMMENTS.

fair authorities to give a \$1,000 trophy and attend to the arrangement of the preliminaries. Despite this the sanction has not been obtained and the club, rightly feeling that such an important event could not be satisfactorily arranged in a few days, announced its postponement and, incidentally, its withdrawal from participation in the automobile events which had been scheduled for the week at the Pan-American.

A Flying Automobile—Perhaps

A strange story comes from Bridgeport, Conn., where Gustave Whitehead is said to have made a combined automobile and flying machine. According to the tale the machine is about 16 feet long and its general appearance is that of a large boat. From each side of the body there are wings made of bamboo poles covered with muslin. These wings are 30 feet from tip to tip. There is also a steering apparatus. The motive power consists of two engines of 10-horse power.

Touring in the Hills

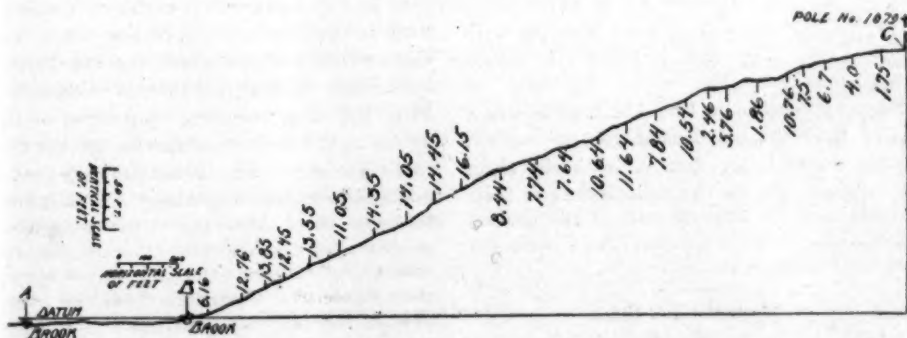
Mr. and Mrs. Harry C. Holcomb and Captain and Mrs. Edward O. Gruener, of New Haven, started to tour New England by automobile July 23 and succeeded in covering 1,200 miles. They used a steam survey. From New Haven they went to Northampton, Mass., making stops at Hartford and Springfield. The second day's journey took them from Northampton to White River Junction and from White River Junction to Bethlehem, N. H. A week was

spent in the White Mountains visiting places of interest. Then the Green Mountains were crossed and Lake Champlain reached. This was crossed by boat and the Adirondacks conquered. They returned by way of Vermont, the Berkshire hills and western Connecticut. The trip was made without accident.

Club Life and Club Uses

Ridicule was heaped upon this paper some months ago because it asserted that automobile club runs would not enjoy lasting popularity. But the facts speak for themselves. It has been shown that runs are conducive to racing on the highway, that little real pleasure is obtained from them except by the most enthusiastic members, and that, as a rule, members prefer to jog along by themselves, or in company with a few friends, to scorching along the highways or being compelled to follow a leader at any pace he may be pleased to set. But runs are by no means the only purpose for which clubs are formed and should be conducted. It is not intended at this time to enter into the details of the possibilities of usefulness of automobile clubs but to briefly call attention to the one great purpose which should be ever present in club affairs, viz.: the maintenance of the rights of automobilists.

There appeared in the papers a few days ago a cablegram from a Parisian correspondent who claimed to have discovered a deep-laid plan to unite all the automobile clubs of the universe to control racing, hold shows,



PROFILE OF NELSON HILL.

On which the Hill-Climbing Test Promoted by the Automobile Club of America will occur Monday, September 9.

A to B, 542 feet on surface of road.
B to C, 237.2 feet on surface of road.

Rises are given in feet and tenths per hundred feet on surface.
Elevation of C above B, 236.10 feet.

NOTES AND COMMENTS.

and tell the people of the world generally what they might and might not do with the sanction of the automobilists. Of course, the story is without foundation. But there is a plan on foot to unite all the clubs of the United States, and that movement, if clubs are to endure, should receive the earnest co-operation of all.

The purpose of such an organization, no doubt, would be to perform, nationally, those things which the Automobile Club of America is performing locally. And surely that work cannot be too highly commended. The manner in which men who have other business to attend to have given their time and their energy to work whose influence will extend from one end of the country to the other is deserving of all praise. The accomplishments of the law committee, alone, would have been ample reason for the formation and enthusiastic support of the club. But the good roads, the equitable laws, the sign posts and the many other advantages secured should not be confined to New York state or to the metropolitan district. What can be done by the club in New York can be done by other clubs in all parts of the country, for automobilists as a class are influential people.

In no city outside of New York has the work been undertaken with enthusiasm. There are clubs in nearly every city of considerable size. Consider Chicago, for example. It has a club of 100 members. Of these about twenty are the really active men. They do not feel that they have received the backing of automobilists, as a class, to such an extent as to warrant extensive efforts, such as have been made in New York. They find it difficult to secure new members. The selfish argument of those approached is that the club does not offer sufficient inducement for the outlay. They overlook the fact it is to the clubs they must look for the maintenance of their rights and the improvement of the general conditions under which they will make use of the highways in the future.

Western Club Spirit

Club spirit is spreading in the west. Following the announcement of renewed activity on the part of the Chicago Automobile Club comes an announcement of a club in Denver and the Iowa Automobile Club has been formed at Des Moines. The officers

and members are: President and captain, Jesse O. Wells; vice-president, W. E. Hamilton; secretary, W. B. McNutt; treasurer, Fred I. Tone; W. L. Hinds, Webster Bishop, Rollie B. Gageol, E. C. Fish, J. R. Windsor, William Sears and E. N. Hopkins, of Des Moines, and T. J. Knapp, of Garden Grove.

A club has been formed at Springfield, Mass. Dr. A. O. Squire has been elected president.

\$2,000 for Sign Posts

The 200 sign posts now in course of erection by the Automobile Club of America between New York and Albany measure 10 feet 6 inches in length and weigh 70 pounds each. Each has a cast-iron arm bolted to the top, showing the direction and the distance to the next town. Including the necessary labor of locating and erecting, these will cost the club over \$2,000. This is exclusive of the cost of survey which has been made of the entire route for the purpose of securing an accurate map, including all hills and a description of the character of the various sections when such is necessary for the use of the contestants.

Pennington and the Tractobile

It may interest those who are familiar with the details of the career of Mr. Pennington to know that he was the promoter of the Pennsylvania Steam Vehicle Co., of Carlisle, Pa., and is now managing that company in connection with J. W. Plank. Although Mr. Pennington's name has been kept in the background, so far as the company's stationery, etc., is concerned, the extraordinary claims made for the Tractobile, which the company intends to manufacture, led to a suspicion that he was the prime mover and investigation shows this to be the case. Mr. Plank is well known at Carlisle where he has long been a leading business man. He enjoys the esteem of everyone there and has a reputation for conducting business his own way—usually the right way. George E. Mills, an attorney, is the only other person known to be interested. The company has commenced fitting up a part of the old Carlisle Mfg. Co.'s building, some machinery is being placed and it is said that 300 men will be employed. No great amount of credence is given the venture, however, possibly be-

NOTES AND COMMENTS.

cause of the extraordinary statements made concerning its product.

Powerful Motors for England

Across the water the Werner type of motor bicycle still holds sway, not that the British are more in love with the method of mounting the motor than we are on this side, but that it has greater power than any of the machines sent over from America so far. A few months ago the English papers were shouting about motors as "auxiliary power" and were assuring readers that nothing more could be expected of such a motor as could be fitted to a bicycle. Now they want the whole thing, no pedals, no anything, but go all the way, up hill and down, with nothing but the motor to do the work. English hills are not to be sneezed at. The motor which will overcome them and give perfect satisfaction must be of ample size.

Hill-Climbing in Europe

Now that road races are no more allowed in France enthusiasts have taken to hill climbing and mile and kilometer events. One of great interest took place on August 11 near Grenoble. The distance was about 6,500 meters, with 7 to 13 per cent rise. Twenty-three started and 19 finished. There were two divisions, one for tourists and the others for speed merchants. In the light-vehicle class Boissy, on an 8-horsepower Peugeot, won in 26:02. In the vehicle class Ribes, on a similar vehicle, won in 26:37.

In the speed division the result was as follows: Vioturette class, Mauliguet, 8-horsepower Georges Richard, 23:10; light vehicle class, Rigoullot, 8-horsepower Peugeot, 22:7-1-5; vehicle class, Kreantler, 16-horsepower Peugeot, 16:22 3-5.

Some days before a race was organized and run between Spa and Malchamps by the Belgian Automobile Club. This route has 3.4 miles of steep grade, such as is characteristic of the Ardennes region. Osmont, on a De Dion motorcycle, was the winner, and climbed the grade at a speed of over 36 miles an hour, in 5:21 2-5, thus beating considerably the previous record made by Baron de Crawhez of 7:21. In the voiturette class (up to 880 pounds) Orban-Viot was the winner, in 12:57 3-5, on a De Dion machine. A much better perform-

ance was made by Baron Joseph de Crawhez on a 28-horsepower Panhard in the heavy vehicle class, or 7:37 4-5. In the light vehicle class Roland, on a Gobron of 9-horsepower, made 7:46 1-5.

Started Fifteen Years Ago

Clarence Walker, of New Albany, Ind., assisted by his brother, Earl, has constructed a steam vehicle and is satisfied of its success. Scores of others have done the same thing, but the remarkable thing about Mr. Walker is that this is the second machine he has constructed and that the first was made 15 years ago. The authorities would not allow him to run it on the road at the time, but he has ever since been looking forward to the time when the ban would be removed and he would be permitted to place his ideas in practice. Mr. Walker is a mechanic of ability and a great many years' standing. He has devoted his time to building boats propelled by motors and is said to have made two or three of extraordinary speed.

Mossberg's Four Cylinder Motor

A four-cycle gasoline motor recently drove a vehicle made at Frank Mossberg's factory from Providence to Attleboro, 16½ miles, in 35 minutes, after being stopped 5 minutes at a railroad crossing. The vehicle has been driven over 1,000 miles without developing serious defects.

This carriage is not on the market. It was built for the purpose of demonstrating that four cylinders and a revolving governor will eliminate excessive noise and vibration. The quietness of the motor when running at full speed—2,200 revolutions per minute—is surprising. The automobile, it may be added, has met the expectations of the builders, and it is stated that Attleboro capitalists who have observed its performance are seriously considering the establishment of an automobile factory. Drawings for another machine, improved in detail, are well advanced.

Cycles and Automobiles in France

According to statistics collated by the tax authorities for the year 1900, there were 975,878 cycles in use in France, or 981,044 saddles, multiplers being taxed according to saddles. Adding to these figures

NOTES AND COMMENTS.

the cycles of policemen, soldiers, et al., some 100,000, not subject to taxes, and taking into account the fact that at least five per cent of cyclists fail to report themselves, we may safely conclude that the number of cycles in use in France will amount to 1,130,000. The department of the Seine alone, including Paris and surroundings, is credited with 212,510, numbering 214,965 saddles. Then follows the department of the north with 44,371 cycles. Corsica, as ever, comes in at the tail end with 282. The number of taxed motor cycles amounts to 11,252 or 14,746 saddles. The number of motor carriages is put at 5,286, 2,402 of which are double-seated and 2,884 with more than two seats. In the department of the Seine are 3,449 motor cycles, or 4,478 saddles, and 1,436 motor carriages. Then follows Seine-et-Oise with 431, Rhone 383, North 380, Corsica not contributing any. The number of motor carriages in Seine-et-Oise is 346, Rhone 220 and North 180.

Compliments in High Places

The Grand Duke Nicholas, of Russia, relative of the czar, sent the following telegram to the Mors factory in France:

"Batoum, Russia, Aug. 1.—We, with Leon Renhold, are the first ones who have passed the Goder pass, which is 7,000 feet, or 2,410 meters, in altitude. It is on the road from Borjom to Batoum. We went from one town to the other, a distance of 240 kilometers, in 11 hours, with your 10-horse-power machine. It is a delightful vehicle."

The Use of the Camera

It is said that the bicycle did more to develop the camera business than any other factor. If such was the case the business will receive a still greater boom from the automobile. On a bicycle the camera, owing to its weight, was a constant source of annoyance and trouble. On an automobile the weight and bulk do not count for anything, and it is said that there are many people who resisted the fascinations of the camera during their bicycle days, but who since using an automobile are enthusiastic in its praise. Appreciating this fact, the Voightlaender & Son Optical Co., of 137 West Twenty-third street, New York, is advocating its well-known Collinear lens

for automobile cameras. These lenses are the fastest made, admitting more light into the camera in a given time than any other on the market. They are used by the foremost amateur and professional photographers and can be fitted to any camera. The company will send its catalogue T, which describes its products, and give samples of its work on receipt of card.

New Corporations and Enterprises

Leader Automobile and Engine Co., Toronto; capital \$250,000; directors, S. E. Van Camp, William C. Hunt, Alfred Beesley, Henry Bennett and William J. Cummings of Toronto.

Fauber Mfg. Co., Elgin, Ill.; capital, \$350,000; manufacturing bicycles, motors, etc.; incorporators, W. H. Fauber, Frank A. Burgess, Henry W. Norton.

Mohr-Jay Automobile Co., Chicago; capital \$10,000; constructing and operating motors, vehicles, etc.; incorporators, W. V. Thompson, Webb Jay, John Charles Mohr.

The purchase of an automobile by L. B. James and its arrival at Chillicothe on the 7th caused the local paper to go into ancient history for the interesting fact that just 82 years ago the first stage coach arrived in that city, making the run from Columbus, 50 miles, in 24 hours and being welcomed by the entire population of the village. And now comes the automobile, covering the same distance in three hours.

The arrival of Fournier will be the occasion of a disagreeable surprise to that gentleman. He comes over in the expectation of competing in the races at Newport and in the Erie-Buffalo affair, declared off for the present by the Automobile Club of America. If for no other reason, it is hoped that the club will be able to run off the 100 mile event somewhere, so that the foreign invaders may not be permitted to return to France without an opportunity to show their speed, and, if possible, secure a portion of the prizes offered.

The city fathers of Canton, O., have passed an eight-mile-an-hour ordinance for automobilists, with the usual accompaniments of lamp requirement and so forth. They have added a novel clause providing that automobiles shall not pass through civic, military or funeral processions and that on

NOTES AND COMMENTS.

the occasion of such the police may require operators to remove from the thoroughfare, a high-handed proceeding not infrequently applied to drivers of horses, so that automobilists, in all probability, will have no objection.

Charles E. Duryea has just contracted with the Reading Standard Mfg. Co. to occupy a building adjoining the Standard plant, where he is going to make delivery wagons. An AGE man visited the Duryea factory recently, and found the workmen hard at work. There seems to be no truth in the rumor that the Duryea works will move to Hamburg, a little place above Reading, where the board of trade is now in control of the Wilhelm bicycle plant.

W. H. Marble, of Brockton, Mass., writes that he recently made a trip in his "newly constructed" auto, known as the Whirlwind, driven by a 7-horsepower engine with water-tube boiler, from Matfield to Brockton postoffice in 4 hours. He omits to mention the distance. Correspondents will please be explicit, as distances and full descriptions of routes would be of interest to other automobilists.

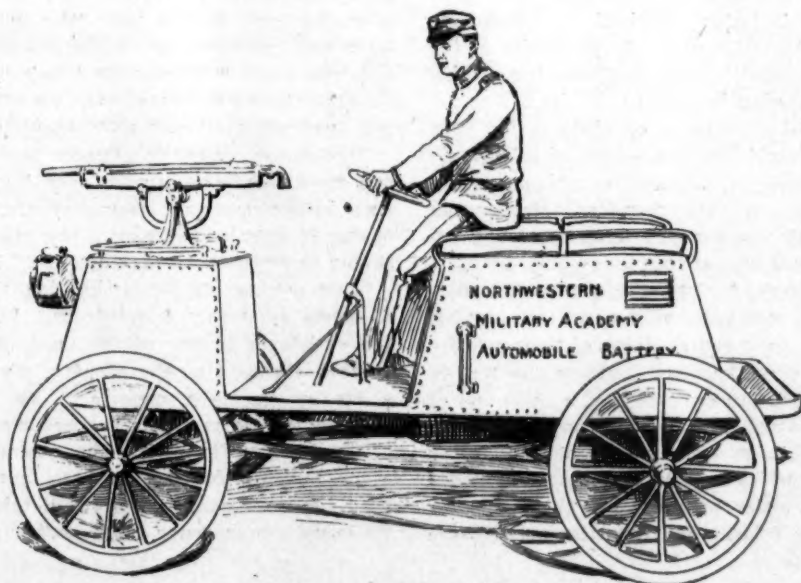
The trip of Mr. and Mrs. Decker, who started from New York intending to go to

Texas, was nipped in the bud. They left their machine in a repair shop and during the night it was totally destroyed by fire. The ridiculous statement was made by the local papers that "the gasoline exploded," and this at an hour when everyone was in bed.

The Standard Mfg. Co., of Reading, Pa., reports that it has no thought of discontinuing bicycle making, and recently secured an export order for 1,000 bicycles from a New York concern, which order is now being executed. The closing up of the Acme plant leaves the Reading Standard the only one in the town.

In the slang of the day, "There is something doing" at the works of the Reading Automobile & Gear Co., Reading, Pa. The company is building an extension at the rear of its works. This extension was caused by the demand for the company's running-gears and Wyoma coaster brake.

The pioneer invaders of Dakota entered the territory less than 50 years ago drawn by ox-teams. These same people, or some of them, will attend an old settlers' reunion at the end of this week and will witness an automobile race. Truly a wonderful record of progress.



MAJOR DAVIDSON'S MOTOR GUN CARRIAGE
On which he expects to ride from Chicago to Washington and back.

STROWGER'S GAS AND AUTOMOBILES

Since the appearance in the press, two or three weeks ago, of an article relative to a gas discovered by Walter Scott Strowger, of Rochester, N. Y., *MOTOR AGE* has been in correspondence with that gentleman in an endeavor to ascertain whether, and to what extent, his gas is applicable to automobiles. Replying to the first inquiry, Mr. Strowger wrote as follows. "I generate my gas by a combination of several common articles, which I compress to a liquid form, occupying about one five-hundredth of the space occupied before. Upon turning the tap for the burner, gas results under any pressure desired. It would be a superior fuel for automobile purposes and would obviate the necessity of pumping up air, or, in fact, having any air-tank at all. In starting it gives a blue flame at once, and saves the use of a generator. It will save the annoyance caused by getting inferior oil. In making my gas on a large scale there is a bi-product of great marketable value, enough to defray the cost of making the gas. A corporation using my system could afford to manufacture the gas and give it away and still get rich."

As this letter contained no definite information relative to the properties of the gas a second inquiry was sent, from which the following is quoted:

"It is, of course, a certainty that if your gas does all that you expect of it, it could be applied to automobiles to immense advantage. We are, therefore, interested in knowing whether you have made any experiments in that line.

"Suppose, for example, you took a cubic foot of coal gas and a cubic foot of your liquid; have you any idea of their relative power or heat units? Is there any way in which you can compare, say, a cubic foot of gasoline and a cubic foot of your liquid?

"We judge from your letter and other matter which we have read that your liquid is not under pressure, but that it is extremely volatile and vaporizes on exposure

to air. Still, from our limited information we are unable to understand your statement, that 'upon turning the tap of the burner gas results under any pressure desired.' Again, if 'in starting it gives a blue flame at once and saves the use of a generator,' is not that fact proof that your gas is low in heat?

"You will understand, we hope, that in asking these questions it is not our intention to cast doubt upon the efficacy of your liquid. On the contrary, we are anxious to learn if it is applicable to automobiles, and to ascertain all the facts concerning it so that we may present them to our readers intelligently and on the authority of the one man who knows all about the invention."

To these inquiries Mr. Strowger replied, promptly, to the following effect:

"From comparisons, which I do not consider perfect or final, I believe one cubic foot of my liquid gas to be equal to 3,000 feet of ordinary city gas, for the following reasons: My gas seems to be equal to six times as much city gas and I can compress my gas 500 to 1. Therefore, one cubic foot of my gas would equal 3,000 feet of ordinary city gas. If this holds true on final tests one cubic foot of liquid gas would equal an amount of gasoline which would be equal to 3,000 feet of city gas, which you know probably more about than I do.

"My gas is liquid only under pressure, and for a blue flame depends upon its mixture* with the proper amount of air, and having it under pressure gives that without having to pump an air pressure.

"I am now testing for car lighting, which it seems admirably adapted for. I have the assistance of one of the most distinguished chemists in the country, who declares my gas is a surprise to him. In fact, my gas seems to be what was expected of liquid acetylene, with the absence of every danger. As soon as I get through with the car lighting tests I will take up its actual use in motor carriages."



CARBURETERS, OR MIXING DEVICES

Being dependent to so great an extent on atmospheric conditions, the grade of gasoline used and the skill of the operator, carbureters are hardly fit subjects for comparison one with another. Nothing of that kind will be attempted, therefore, in this article, which is designed to describe and illustrate some of the types commonly used. All will work, some better than others. All have adherents and must therefore be considered commercial factors.

The simplest form made is known as the surface carbureter and in this the air is drawn into a receptacle containing gasoline. Taking up or becoming saturated with the lighter particles of the gasoline in its course, it passes to the motor, of course to the explosion chamber in the case of a four-cycle and to the crank chamber of a two-cycle engine. There are several forms of surface carbureters but the same objection applies to all of them, viz.: that only

tor piston drawing the air into the tank over the gasoline, and then into the explosion chamber of the motor. There have been many improvements designed to arrest the flow of air and saturate it more thoroughly and to increase the carbureting or evaporating surface. Then came a coil of pipe on the bottom of the tank, through which a portion of the exhaust product of the motor was passed, heating the gasoline and causing it to generate vapor more freely than in the other types.

This form is now practically obsolete and in its place we have mixing or spraying devices designed to use all of the gasoline and to give an approximately uniform quality of vapor. There may be, among readers of this article, some by whom the properties of gasoline are not understood and to whom the requirements of a carbureting or mixing device are unknown. For such just a word of explanation. Gasoline, without air, cannot burn. With air it burns or, if in the form of vapor, explodes when fire is applied. The force of the explosion is largely governed by the degree of excellence of the combustion. Hence it is necessary to mix with the gasoline a certain amount of air. This is the purpose of the carbureter or mixer. The suction stroke of the engine draws in air with great velocity. This has been taken advantage of to perfect the mixture. Practically all of the mixers now used are so designed that the air, sucked in as stated, comes in contact with gasoline, supplied in quantities regulated by a valve, and gathers it up and carries it to the engine where the mixture is exploded.

Figure 1 shows a carbureter which has a needle valve on top, the nozzle of which reaches down into the air inlet. Directly below the same is a cylindrical screen of about 36 mesh, which forms the mixing portion of the device. The gasoline drips down into the inner chamber formed by this screen and is carried through by the velocity of the air, mixing with the air, of course, in its passage. A tapped opening is shown at the bottom of the carbureter,

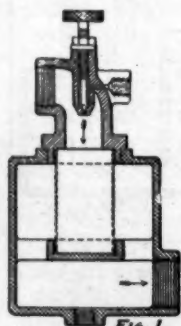


FIG. 1.

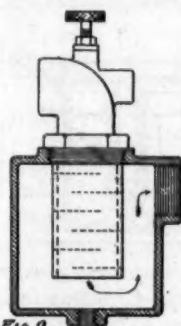


FIG. 2.

the lighter or more volatile portion of the gasoline is evaporated, the remainder gradually becoming heavier until it finally refuses to give off vapor except under heat.

The primitive form of surface carbureter was a flat rectangular tank, with an opening at opposite ends in the direction of its length, which was usually two or three times its width. The tank was filled about half full so as to leave room for the air to pass freely over the surface of the gasoline. One of the openings was free to the atmosphere and the other connected by a pipe to the induction or admission inlet of the motor, the inductive action of the mo-

CARBURETERS OR MIXING DEVICES.

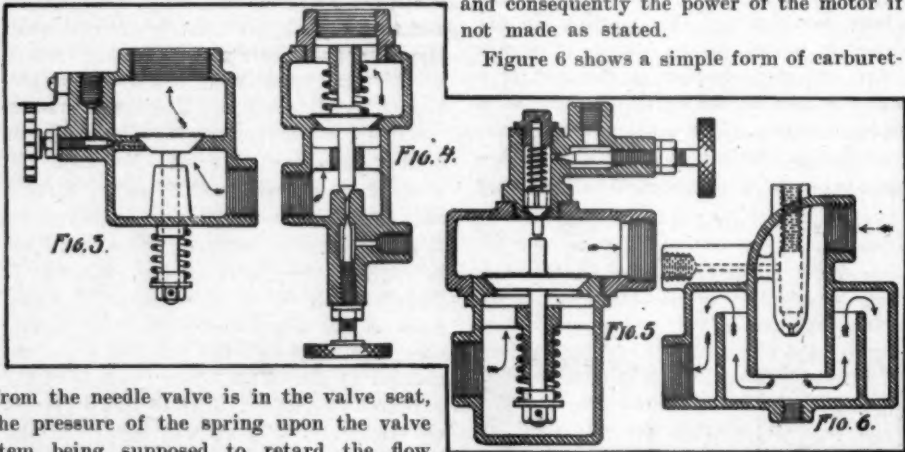
in which a cock is placed. This is used to gauge the amount of gasoline flowing from the needle valve while the carbureter is being adjusted.

Figure 2 is similarly designed, but instead of the cylindrical screen as in Fig. 1, it has a tube extending down into the body to within a short distance of the bottom. Horizontal slots are cut in this tube from opposite sides and screens are inserted in these and soldered in place. This construction, while thoroughly mixing the air and gasoline, allows an almost uninterrupted passage for the same. The slots are so cut as to leave an opening without any screen, equal in area to that of the air inlet on top of the carbureter.

Figure 3 is of recent design. An auxiliary valve is employed. The gasoline opening

In Fig. 5 the gasoline supply opening is directly above the auxiliary valve stem, which does not quite touch the nose or extension on the lower end of the gasoline check valve. This valve has a number of small grooves around the lower grinding portion of its stem directly above its seat, so as to allow the gasoline to pass through, when the gasoline valve is raised from its seat by the extension stem of the auxiliary valve. The auxiliary valve is held upon its seat by a spring. The diameter of the valve opening of this form of mixing device should be at least 40 per cent greater than that of the induction valve of the motor, on account of the additional weight of the valve and the spring pressure, which causes a throttling action, and which would reduce the size or quantity of the charge and consequently the power of the motor if not made as stated.

Figure 6 shows a simple form of carburet-



from the needle valve is in the valve seat, the pressure of the spring upon the valve stem being supposed to retard the flow when the motor is not in use. When this auxiliary valve is raised by the action of the air, the gasoline is drawn up into the inlet pipe of the motor along with the air. The partial vacuum formed during this operation assists in vaporizing the gasoline.

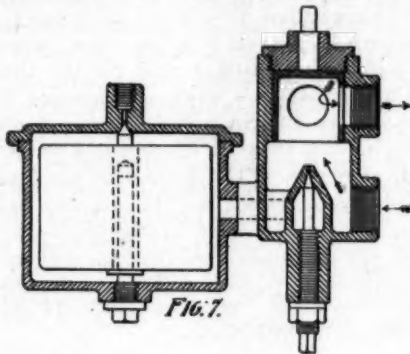
Another type is shown in Fig. 4. The auxiliary valve has an extension of its stem on the opposite side of the valve and beneath the seat of the same, passing through a guide and closing the outlet of the gasoline supply from the needle valve. As shown in the drawing the auxiliary valve does not rest upon its seat but is a slight distance away so as to allow the cone point on the extension of its stem to check the flow of gasoline from the needle valve when not in use.

er without screen, valve or float. It has a tapped opening in the bottom, as in Figs. 1 and 2, for the purpose of inserting a cock, to determine the flow of gasoline. The needle valve stem is not shown, but is similar to those in the other forms here shown.

Figure 7 shows a float feed form, originally of European design. The float is supposed to keep the gasoline at a constant level, just below the outlet nozzle, above the needle valve. The inductive action of the motor piston draws the gasoline from this nozzle into the pipe along with the air. A regulating device is shown directly above the needle valve nozzle to regulate the supply of mixture to the motor. Some makes of this type have an additional air opening as shown, which in connection with the outlet for the mixture to the motor, is

CARBURETERS OR MIXING DEVICES.

controlled by a lever attached to the spindle which projects through the cap on top of the mixing chamber. The slot or opening in the controlling device which regulates the outlet opening from the carbureter is made of flat, oval shape, so that the extra air opening may be entirely closed without closing the mixture outlet. When it is



turned in the opposite direction the mixture and extra air opening can be controlled together. Modifications of this type of carbureter are more extensively used abroad than in the United States, the preference here being toward simpler and less costly forms.

All the carbureters shown in this article are without air or mixture controlling devices, except Fig. 7. The better plan is to have a controlling or throttling device on both air inlet and mixture outlet, if a perfect regulation is desired. By throttling the air inlet, with mixture outlet full open, a stronger or rich mixture is obtained. With air inlet full open and mixture outlet slightly throttled, a weaker mixture is produced. With both throttled at varying points a strong or weak mixture may be obtained as desired, without regulating the gasoline needle valve opening.

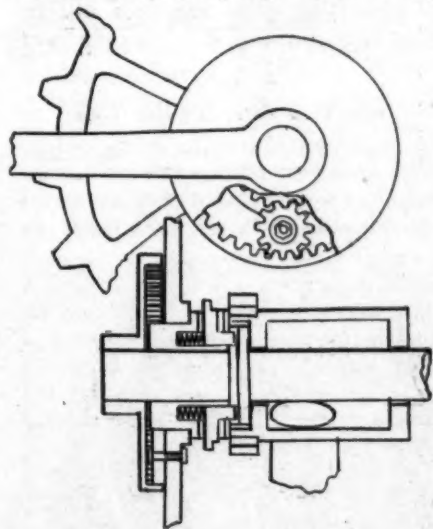
The form of mixing valve shown in Fig. 3 is not intended to be substituted for the induction or admission valve of a four-cycle motor, as has been done, not only by amateurs, but by manufacturers who ought certainly to know better.

A New Two-Speed Gear

A new device for the variation of speed in the transmission of power in a bicycle is the production of P. G. McCollam, of Easton, Conn. The variation of gear is confined to the driving sprocket, which is not

directly connected to the crank-shaft, but is rotatably located on an auxiliary hub or sleeve thereon. The outer end of the hub is provided with an annular gear. Attached to the crank on the side of the sprocket is a circular disk with an inwardly directed rim or flange provided with an internal gear, and between the loose hub on which the sprocket wheel is located and this annular gear is mounted, on the sprocket, a series of pinions meshing with both of the annular gears. This series of gears comprises in its entirety the familiar form of two-to-one gear popularly used in change speed devices.

On the crank-shaft is an annular flange forming a clutch-rim which abuts against an inwardly directed flange located on the inner surface of the barrel of the crank bracket, and said clutch-rim is provided, on its outer face, with notches. The loose hub of the sprocket wheel above described is provided with an inwardly projecting flange on which is a clutch device, pressed toward the clutch-rim or flange attached to the crank-shaft, as previously described, by spiral springs seated in logi-



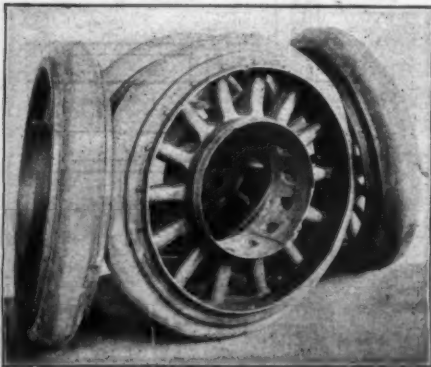
tudinal chambers arranged therefor in the hub of the sprocket wheel. When so located this clutch member is rigidly attached to the crank-shaft by means of lugs which engage with the recesses in the outer face of the clutch-rim on the shaft, thus locking the gear mechanism and driving the sprocket directly with and at the same speed as the crank-shaft. Located on the outer sur-

CARBURETERS OR MIXING DEVICES.

face of the crank-hanger is an annular sleeve, adapted to slide longitudinally thereon, but held against a rotative motion by lugs or studs seated in the longitudinal grooves on the hanger. This sleeve is arranged to be actuated as above described by a series of bell-cranks and connecting rods, contained within the lower frame tube, terminating in a crank connected with a small hand-lever, located at the upper end of the tube. When by this means the sleeve is moved in an outward direction it moves the intermediate clutch device just described so that it disengages from the crank-shaft but becomes connected with the sliding collar in such manner as to hold the loose hub and the annular gear thereon stationary with the crank-hanger. In this condition the motion of the cranks is not carried directly to the sprocket, but the internal gear on the disk attached to the pedal acts upon the small pinion meshing between it and the now stationary gear on the hub. Thus, as these pinions are pivoted to the sprocket, the latter is carried forward by the pinions as they revolve around the gear on the hub of the sprocket-wheel. By this device two speeds are given without having to in any wise alter the length of the chain.

These Tires Carry Twelve Tons

In the matter of tires for heavy vehicles makers have been puzzled to supply something which could be relied on to endure the extraordinary strains put upon them. In



Europe, where heavy traction has reached a stage many years ahead of this country no attempt has been made to fit the heavier vehicles with rubber tires. The makers

came to the conclusion, as shown in an article published in this paper three weeks ago, that it was practically impossible to supply tires which would render satisfactory service. There is, of course, a great deal of difference between running a vehicle about the streets of the better part of Chicago and up and down the hills and over the cutting country roads of England, but the Calumet Tire Rubber Co. has nevertheless performed a feat at which others failed. It undertook to supply tires for the Hub Motor Transit Co.'s buses, now running in Chicago, to sustain a weight of 18,000 pounds. The tires are 6 inches in diameter and, of course, solid. Instead of the load originally contracted for the company has been carrying loads of 24,000 pounds for over 100 miles and the tires are still apparently in as perfect condition as the day they were fitted. They are shown in the accompanying illustration.

The P. J. Dasey Co., 160 Washington street, Chicago, has secured the entire stock of the late Overland Manufacturing Co., Chicago, maker of the Overland gasoline vehicle, and will dispose of the parts and rigs left on hand at the time of the winding up of the company, owing to Mr. Hubbard's protracted illness. The stock consists of motors, bodies, one complete and one partially completed machine, as well as all patterns, drawings, etc., necessary for the production of a high class machine. All parts will be sold at close figures in order to close up the business.

A formal application has been made to an Ohio court for the dissolution of the Geneva Cycle Co., whose capital stock was \$100,000 and whose business was sold to the A. B. C.

Another suit has been commenced against the Olive Wheel Co., of Syracuse, this time by the Standard Spoke & Nipple Co. The amount of the claim is \$461.

New cycle stores: Alvin Norwood, Paw Paw, Mich.; W. F. & C. E. Woods, Portsmouth, N. H.

Write one letter to this paper, enclosing stamps to cover postage and stating whose catalogues are required. They will be forwarded by return mail.

Makers are advised promptly of the names and addresses of applicants for their catalogues.

LATE ADDITIONS TO TIRE DESIGNS

With the decline of the bicycle there was a corresponding decline in the number of applications filed for pneumatic tires and their parts. The sudden success of the automobile has led to a revival, and one of the busiest departments at Washington at present is that in which seekers after fame and fortune in the tire line seek protection for their designs. Not all of those which go there secure a patent, and not all of those who secure a patent ever succeed in producing a marketable article. But, out of the hurly-burly, comes all that is good, on which the public depends for the comfortable riding which, since the invention of our Gaelic friend, Dunlop, has been its lot.

Within the last few weeks there have been designed for public approval a great many tires, pneumatic, solid and non-descript, some of which it will be the purpose of this article to describe. In the pneumatic class a tire designed by Herbert E. Irwin, of Galesburg, Ill., is one of the best, or at least the most promising. It is shown sectionally in Figure 1. It is of the detachable class and, of course, requires a rim especially designed for its reception. In order to prevent the creeping of the tire when applied to traction wheels, it is proposed that the retaining flanges shall be slightly cut away to allow for the introduction of a small transverse lug of metal or other substance, fitted into the rim as shown at B in the illustration.

Another pneumatic of the often-attempted cellular design is that of William E. Hoyle, of Providence, R. I. It differs from various others, based on the same principle, only in the matter of design. It is composed of

a number of short cylindrical sections, the design of which is shown in Fig. 2, which is a sectional elevation of a segment of the complete tire. These sections are of two patterns and are so constructed as to fit one into the other, forming an air-tight joint. In inserting the sections into the tube or cover, the tube is first slit longitudinally along the side next the rim. The core-sections are then introduced successively into the tube-chamber, at the same time cementing the adjacent meeting surfaces thereof and compressing them together end-wise, thereby rendering the cells or pockets thus formed by the union of the segmental members airtight, the degree of air pressure therein being due to the force employed in compressing the sections together. The opening in the outer tube or casing is then closed in any suitable way. The several sections or cores may be, before placing in the tube, properly prepared for vulcanizing and the whole placed in a mold after completion and vulcanized into an homogeneous mass.

In a modification of the same device there is an inner core, composed of sections of practically the same style as those just described, which are surrounded by another set of cylindrical segments with an opening through the center of a size equal to the external circumference of the inner core. This outer member is also cellular, being placed in the tire and the ends joined as described above. The practicability of this device may be questioned on the ground of the difficulty of obtaining sufficient air pressure.

A third is the invention of Isaac S. McGiehan and is shown sectionally in Fig.

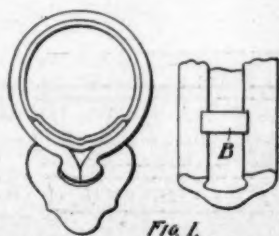


FIG. 1.



FIG. 3.

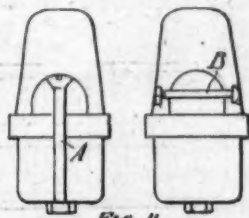


FIG. 4.

LATE ADDITIONS TO TIRE DESIGNS.

3. Its only point is the design of the flat thread shown in the illustration.

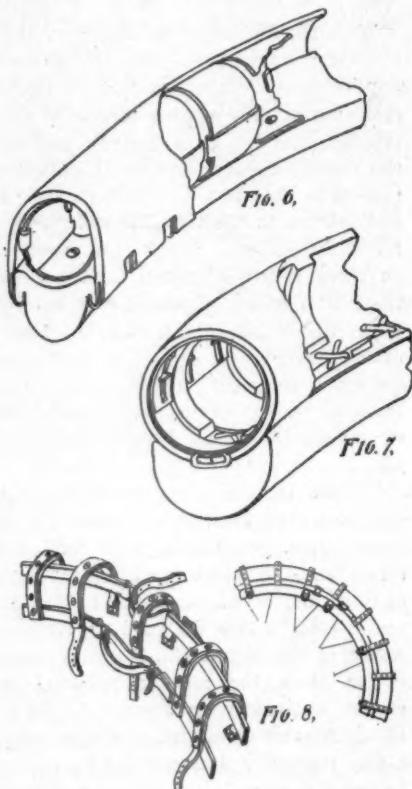
Harry A. Palmer, of Erie, Pa., has produced a tire of the well known form, but wherein a tire of U-shaped section is held in place on a rim with a flat periphery by means of annular flanges, provided on their inner faces with one or more rows of lugs designed to be pressed into the sides of the tire to assist in retaining it in position. The tire is slightly wider than the rim and so is compressed in the process of attaching the flanges.

A method of attaching a solid tire to a flat steel rim without the usual outwardly-extending flanges and is shown, sectionally, in Fig. 4. A noticeable part of this device is a ring or semicircular section, which serves as a means of attaching the tire proper to the rim by two sets of bolts, one, shown at A, for attaching the ring to the wheel, and the other, at B, for securing the tire to the ring. It is proposed that this ring shall be of rubber vulcanized to a consistency considerably harder than the tread portion. Wm. Kightlinger, of Marysville, O., is the patentee.

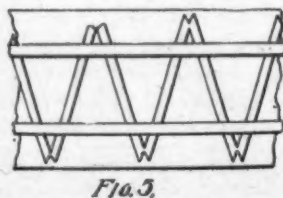
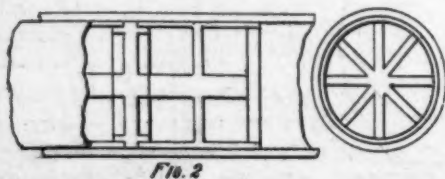
Frederick G. Davis, of Chicago, seeks to improve that class of tires held in place on the rim by a longitudinal band or wire resting on a number of transverse wires. He claims that when a series of separate wires are used considerable trouble is encountered from the wires becoming misplaced during the construction of the tire and his aim is to substitute for the series of single wires, a continuous wire bent back and forth across the tire, as shown, and partially severed at the bends to permit of extension or compression lengthwise.

Of the spring class, hitherto absolutely useless, nothing has been developed which seems likely to succeed. Hyman Lieberthal, of Chicago, thinks resiliency may be derived from a series of cylindrical springs, within an outer casing of rubber or other material. The springs are made of two parts, practically semicircular in section making up

into a cylinder when united for application to the tire. He has two designs and the difference in them is in the method of attaching the metal plates and securing



the casing to the rim. In that shown in Fig. 6 the metal plates are secured to each other by four projecting ears, which are bent inwardly around the edge of the other section, on the corners of which are four slight projections. This tire is secured by a series of flat metal hooks, engaging a flange on the rim. The second is attached to a crescent rim and the casing is secured around the springs and laced. The sections of the springs are secured by four T-shaped lugs on the portion at the rim side of the tire, which are bent inwardly and secured



COMPRESSION AND COMBUSTION.

in four T-shaped slots, in the other portion of the springs.

Departing from tires proper Hiram P. Maxim and Arthur F. Bardwell have made, patented and assigned to the Electric Vehicle Co. a friction strap, attachable to any vehicle wheel. This device is clearly shown in Fig. 8. In the preferred form the members are composed of straps of tanned leather, but they may be composed of any pliable non-metallic ma-

terial that will accomplish the desired results, but it is intended that the transverse members shall be provided with spurs or studs in numbers sufficient to assist in the grip of the wheel upon the surface over which it is being moved. The device will hardly become part of the equipment of every carriage, but may be found useful by those who have had to resort to such tricks as binding the tires with rope to secure sufficient adhesion to enable them to move.

COMPRESSION AND COMBUSTION

The ratio of compression in any given engine is, of course, dependent on design, but the maintenance of such ratio of compression will devolve upon the user of the engine and is practically a matter of attending to valves and pistons, a subject on which a few hints may be acceptable.

In considering the total efficiency of the motor, however, it must be remembered that proper compression is but the stepping stone to resulting power from the expansion stroke, hence the conditions necessary to ensure good compression are seen to have a double value, or, to put it another way, with leaky valves or piston there would be a double loss during the period of compression and combustion.

Of the two valves, the exhaust valve has the greatest bearing on total results, for if this valve be leaky the compression will be bad on account of loss of quantity of explosive mixture during the compression stroke, the degree of compression being necessarily proportionately lower, resulting in a lower initial temperature at the moment of ignition, imperfect combustion, and loss of power on the piston during the working stroke.

Leakage past the piston would operate in the same direction, but not to the same extent, and an ill-fitting inlet valve tends to further rob the engine and shows effects somewhat similar, but less pronounced so far as the engine power is concerned, because in the first place the valve area is smaller and the resultant loss on the compression stroke is correspondingly less, a similar remark applying to the firing stroke.

The exhaust valve, moreover, is far more liable to go wrong than the inlet or induc-

tion valve. A large valve is more difficult to maintain tight than a small one; the greatest factor in destroying the fit of the valve is the corrosion due to imperfect combustion and extreme high temperature of the escaping gases, whereas in the case of the inlet valve there is a cooling effect due to the entering gases.

Whenever the mixture is badly proportioned imperfect combustion will result, and imperfect combustion means a carbonaceous deposit in the cylinder and valves, the effect on the exhaust valve in particular being a serious leakage due to "pitting" caused by pounding of the particles of carbon.

A somewhat similar effect may be produced on both valves by the deposits from bad lubricating oil; such oil finds its way to the top end of the cylinder and gradually becomes caked into a hard mass of carbon or cinder formation which at a certain stage in its formation breaks up into particles, and those particles imbed themselves between the valve faces, so preventing the proper closing of the valves. The inlet valve is also very liable to be affected by foreign substances carried through the connecting pipes from the tank and carbureter, thus pointing to the importance of straining all gasoline into the tanks. The above instances, however, are given as relating to valves correctly fitted and proportioned in the first place, but there are other conditions met with in actual practice. Most motor valves are formed on what is known as the mushroom pattern, the lip being usually machined or ground at an angle of 45 degrees, the seating, of course, being turned to correspond.

In order that the valve may open and

COMPRESSION AND COMBUSTION.

close with smoothness and certainty and in true relation to the seating, a valve stem guide is provided, the entire construction of valve and guide calling for similar care in construction to the piston, piston rod, and guide of a steam engine. Two or three conditions, however, may be found to exist and which are due to defective workmanship in the first instance, any one of which will effectually prevent a valve from acting well in practice.

In the first place the valve stem may be slightly eccentric to the valve head, in which case no amount of grinding (as ordinarily understood) can bring the seat true, always providing that the guide is a fit to the stem, and that guide and valve seating are in line. Reversing the order—i. e., with a true valve and stem, but with valve guide out of line with seating, would give the same result, but would be more difficult of correction. Where an exhaust valve is found to be deeply corroded it will be necessary or advisable to remove it from the motor and turn it up in the lathe, removing, of course, as little metal as possible. This chucking in the lathe between centers will also prove the truth of the stem to the valve head, and it is astonishing how many valves may be found faulty in this respect.

Theoretically speaking, exhaust or other valves should not be ground in with emery, but with some other abrasive, for the reason that emery is liable to become imbedded in the valve or seating and so continue to cut "rings" in the surfaces; but a better way of putting it would be to say that where a valve is so badly out of order as to necessitate the use of a more powerful grinding material than crocus powder, the valve should be removed and returned in the lathe. Apropos of grinding in exhaust valves it may be mentioned that the majority of engines are faulty in design by reason of the exhaust valve seating being formed in the main casting, i. e., in the casting of the combustion chamber. This construction renders it difficult to trim up the valve seating by cutting tools except where special appliances are at hand, and it would be a great advance in constructive detail if the exhaust valve and seating could be made detachable, as is the case with the De Dion and most other inlet valves.

Grinding in exhaust valves on the road

side is not always a pleasant task, especially if the "pitting" is somewhat deep; it is therefore policy to carry at least one spare exhaust valve, which, even in a new one, should be carefully ground in to the seating it is to occupy before leaving home. By this method of replacement it is easy to keep the valves right, providing the seating is true and in good order; to test for this, take a newly-turned and ground valve and stem which is known to be true, and smear the bearing surface of the valve face with white lead; carefully note after giving the valve a few turns whether there is a complete and even circle of white lead transferred to the seating.

If the valve seating is found to be very bad, and involving the removal of a considerable amount of metal, in the absence of a special reamer or cutter for the purpose, a lead lap or grinder should be made with a stem which is a good sliding fit to the valve stem guide; fast-cutting emery powder may then be used, and the lap trimmed up at intervals if required, but before the final grinding in with crocus powder, every trace of the coarse emery must be washed away, a hot soda bath being the best medium for this.

Similar remarks would apply to the inlet valve, but as this is usually removable complete it is more easily dealt with. The most insidious disease of the inlet valve, however, is due to the variation of the spring strength, for a spring tension that works well when the piston is in order and the suction powerful, will be too strong when the piston becomes leaky from wear. On the other hand, these springs are liable to become too weak through loss of temper due to the great heat, the difficulty being to locate this fault.

We may now briefly consider the piston and some of the points controlling its efficient performance. In the first instance it must be remembered that design, construction, and condition of working are totally different to the steam engine, the wear being far heavier in the case of the gas engine, and imperfect fit having a greater bearing on the engine power. The form of piston used in the internal combustion engine is known as the "trunk" type, in which the piston proper is of great length in proportion to the cylinder bore, and by making it hollow and fitting it with a

COMPRESSION AND COMBUSTION

cross head it is made to do duty as its own guide, the piston rod being entirely dispensed with and the connecting rod to crank working direct from the piston cross head pin. This construction has answered very well, and has rendered it possible to considerably economize space by shortening the engine, but if the action be studied it is found that on the power stroke there is a not inconsiderable side thrust or diagonal effort of the piston tending to wear the cylinder oval and also putting a very heavy duty on the piston rings, added to which is the difficulty of lubrication at such excessively high temperatures, and, in the case of the smaller engines, the very high rate of piston speed. Consequent on those conditions, the wear of both piston rings and cylinder is more rapid than in the case of the steam engine, and more pronounced in small high-speed engines than in slower-moving engines of greater power.

Gas engines are commonly fitted with three piston rings in a simple grooved piston of the Ramsbottom type, and on the correct fitting of these rings the piston efficiency entirely depends. In the steam engine it is common practice to employ built-up pistons which permit of the ready insertion or removal of piston rings without fear of breakage, and in other types the piston rings are reinforced or sprung outward by springs which may be adjusted to a given pressure. Neither of these features, however, have, so far as we know, been successfully incorporated in the gas engine, hence the spring pressure on the cylinder walls is just what is due to the elasticity of the compressed metal ring, and it is obvious that if the pressure be correct where the rings are new, it cannot be correct or sufficient after a certain amount of wear. The chief wear on the piston rings takes place on the side of the piston furthest away from the crank pin when midway on the power stroke, and merely turning the rings round to a new position will in many cases improve the compression, but there can be no doubt that in the case of the smaller engines a more frequent renewal of piston rings is desirable. The outward wear of piston rings, however,

is not the only wear they are subject to, for the piston body is somewhat smaller than the cylinder bore when the engine is new, and the diagonal thrust and slightly rocking motion referred to sets up a slotting action or side wear between the piston rings and the grooves in which they fit, consequently in fitting new rings this, together with cylinder wear, must be taken into account.

The common practice, in the smaller engines at any rate, is to stock renewal piston rings of exactly similar size to the original, but the amount of wear on cylinder wall's and piston grooves may be quite sufficient to render such rings but little more effective in securing compression than the old ones removed.

The teaching of all this is that piston rings should be more frequently renewed and specially and individually fitted, particular care being taken at the meeting of the two ends of the piston ring, which ends are generally formed by a diagonal saw cut across the ring at the thinnest part, and should afterward be trimmed with a file so that they just meet when compressed into the cylinder bore.

Various metals, including steel and phosphor bronze, have been tried for piston rings, but nothing is found to answer so well as close-grained cast iron, which is sufficiently elastic and takes a high polish which under good lubricating conditions forms a hard and wear-resisting skin, whereas steel rings under similar conditions wear to a dull white surface and never attain the polish of cast iron. In the smaller type of engine a compression of 2 or 3 millimetres is allowed the piston rings, and new rings should be turned correspondingly larger in outside diameter to compensate for cylinder wear. A more frequent overhaul and critical inspection of piston rings would benefit the majority of motors running, and the very markings or varying polish found at different points in rings and cylinders which have seen some wear will prove instructive in connection with some of the points raised.—T. H. Hawley, in the *Motor Car World*, London.





FROM CORRESPONDENTS



Chicago, Aug. 24.—To the Editor.—While it is commonly supposed that gasoline machines are fool-proof, so far as burning up is concerned, I want to tell you that it is quite possible for trouble to occur when the machine is in the hands of a careless man. Some time ago I was present at an examination of a gasoline vehicle in a Chicago store. The man in charge, perhaps because of boyishness or perhaps to ascertain just what happened inside of the cylinder, disconnected the motor so that it was possible to see into it and turned the wheel over so as to secure a spark. He had forgotten to make allowance for the fact that there was a charge of vapor in the cylinder and traces of gasoline about the machine. The result wasn't serious, for the blaze was smothered in a few seconds, but the incident shows how serious a thing may occur by monkeying with things which were never intended to be monkeyed with.—Yours, etc., S. Arthur.

The Pressure Nullified

Bryan, Ohio, Aug. 24.—To the Editor: An experience which I believe to be of frequent occurrence with new operators of steam carriages has occurred to me, and I believe it may be of interest to operators. When I got my steam machine last year I failed to get good results from the fire. My machine is of the kind where the gasoline is conducted from the gasoline tank to the lower end of a boiler tube, then up through the tube, across the top, down through another boiler tube, and from there to the burner tube, where it is sprayed as a gas into the fire-box. A valve is in this pipe between the gasoline tank and the boiler and I made the mistake of regulating the flame with this valve. I would open this valve a certain amount and the valve at the mouth of the burner tube to its full-

est extent. I found that my fire burned yellow and did not give good results. I did not know what to attribute it to, but finally discovered that I had opened the valve between the gasoline tank and the boiler too much; the gasoline was sprayed under the fire too rapidly for the amount of air which it could obtain and a good mixture was not the result.

I was advised to try a higher air pressure and less gasoline. I formerly used 40 pounds pressure, but now use 60 on the gasoline tank. I open the valve between the gasoline tank and the boiler to its fullest extent and regulate the amount of gasoline by the valve at the mouth of the burner tube. In this way I get more gasoline in the boiler tubes and have it heated for a longer time. When your fire burns yellow pump up your air pressure and turn off the gasoline until it burns blue.—Yours, etc., Will W. Morrison.

(The argument herein should be plain to every user who makes an effort to understand his vehicle. The object of the pressure on the tank is to force vapor into the burner so rapidly that it will syphon in with it sufficient air to make a perfect mixture and secure complete combustion. By regulating by the wrong valve Mr. Morrison practically led his gasoline from a small pipe into a larger one, thereby reducing its speed of travel and counteracting the effect which the pressure in the tank is created to produce.—Ed.)

Standardization of Parts

New York, Aug. 26.—To the Editor.—The remarks of your contributor, "A Man in the Trade," published in the current issue, are in the main sensible, and entitled to consideration. But I do not think he has taken into account the difficulties with which the maker of a steam vehicle would have to contend were he to attempt to, let

FROM CORRESPONDENTS

us say, double the size of all the connections contained in his vehicle. Of course, it would have been better had the makers started with larger connections, but it is difficult for any one not actually engaged in manufacturing, to understand the infinite amount of trouble it would require to make a sudden change from one size to another. I fully expect to find that some of the changes to which your contributor refers will be made by all makers in due course, but a little at a time. I shall be surprised if some of the next lot of machines put through do not contain larger parts in some places. But do not let us expect too much at the start. All things come as the result of experience. The makers are certainly doing, as rapidly as circumstances permit, and much faster than is common in business, all they can to overcome the difficulties presented to them. But they desire to be sure they are right before they make a change. No conservative maker will make alterations in his patterns until he knows, from experience, that the change will prove an advantage. There would be no sense in changing from one size to another until the superiority of the new size had been demonstrated, not only over fittings of the old size, but over all others which it might be possible to use.

In the matter of ridiculous threads I agree fully with your contributor. I have had no actual experience with them, but it seems to me to be evident on its face that to put out a thread which cannot be easily duplicated is foolish from any point of view.

I, in common with a majority of men in the trade, admire the way MOTOR AGE has taken up the discussion of matters of educational interest and believe that a free exchange of ideas, even though they touch a few tender spots, will prove of great advantage and a great help to the development of the industry. We who are engaged in making or selling automobiles can not see the whole country over and are glad of assistance, intelligently rendered.—Yours, etc., Another Man in the Trade.

Dayton, Ohio, Aug. 26.—To the Editor: We wish to express our hearty approval of the article on Standardization of Automobile Parts which appeared in your issue of August 22. The position assumed by the writer of that article is all right, and for

some time we have been looking in the direction that he points out. Referring to the articles of our manufacture, we beg to state that in our case we are using threads of standard size so far as possible, as well as diameters of standard size. We should be very glad to co-operate with others in the trade to bring about a standardization of all parts at the earliest possible day.

We are also in hearty sympathy with the article mentioned in his advocacy of larger fittings. We manufacture $\frac{1}{4}$ -inch fittings to meet the requirements of the trade, but we frankly acknowledge that we regard them as too small, and for that reason are also manufacturing a line of $\frac{1}{2}$ -inch fittings, the adoption of which we advocate, and in some parts of the vehicle we advocate still larger than $\frac{1}{4}$ -inch.

The arguments used by the writer above mentioned are to our minds conclusive, and we trust will meet with a hearty response on the part of the trade generally.—Yours, etc., The Dayton Motor Vehicle Co., G. N. Bierce, vice-president and treasurer.

Backfiring Extraordinary

Ottumwa, Ia., Aug. 24.—To the Editor.—I operate a motor cycle and have experienced, more than once, a sudden stop of the motor as if back firing were taking place and this, too, when the compression cock has been open. The spark was retarded as much as possible and the engine was not hot. I have had a lot of theories advanced, but none that convinces me. Can any reader tell the cause of the difficulty?—Yours, etc., W. R. T.

Wants Larger Steam Vehicles

Carthage, Mo., Aug. 24.—To the Editor.—Will you permit me, a timid man, who fears to confess his ignorance among his neighbors, to ask why makers of steam vehicles consider it necessary to confine their vehicle to so small space? I am encouraged to ask the question by the article in last week's issue on the standardization of parts. I think I remember seeing in your paper some months ago, a question on the same subject, but no one seems to have volunteered an answer.

We have gasoline vehicles of all sizes, from the pretty little runabout for town use to the giant for country roads. Do

FROM CORRESPONDENTS.

the makers of steam vehicles desire it to be understood that their vehicles are intended to be used only for boulevard use? If not why do they consider it wise to confine themselves to such puny dimensions? Why not give us a carriage in which we can sit with comfort, carry our tools without having to crawl in among the working parts to get at them and, finally, when some trifling repair is needed, smother ourselves with dirt and dust in a frantic effort to reach the spot? Perhaps these questions are foolish, but I'm from Missouri.—Yours, etc., L. L. Mitchener.

Test of a Locke Carriage

Salem, Mass., Aug. 19.—To the Editor.—It may interest you to know that Mr. A. N. Locke, treasurer of this company, accompanied by his wife, has just completed a trip of about 400 miles through the White mountains, in one of the steam carriages built in our factory. Perhaps the unique feature of the trip was the fact that it was accomplished without a mishap or breakdown with the exception of the breaking of a water glass in the gauge on the side of the carriage. As the carriage was fitted with the Locke safety automatic shut-off gauge Mr. Locke at once renewed this glass without loss of steam or water as the valve shut automatically as soon as there was an extraordinary rush of steam to the broken glass. The trip was over the roughest kind of roads and the deep sand in many places put the carriage itself to a severe test. Mr. Locke frequently met carriages which were pulled up for repairs and he assisted several operators in getting machines in shape. He found the Kelly generator a great time saver, especially when he desired to start his carriage after a short rest on the road. He discovered that the fault which many people are pressing against the Kelly generator, namely, that of smoking a great deal, could be easily remedied by pouring a few drops of alcohol into the pan when ready to start the carriage. The carriage was equipped with parts and fittings manufactured wholly by this company.—Yours, etc., Locke Regulator Co.

Due to Clogged Pipes

Bloomfield, N. J., Aug. 17.—To the Editor.—We had occasion to repair Locomo-

bile No. 298 some time ago. The trouble was in not getting enough fire, although we pumped the gasoline tank to its limit. After considering the matter we disconnected both ends of the supply pipe without removing from the wagon. We then fitted a connection to one end and turned on 80 pounds of compressed air from our supply tank, with the result that the pipe was entirely cleaned. We had no further trouble in generating steam.—Yours, etc., A Loppacker.

(Mr. Loppacker is recommended by Sheffield Phelps, who has since taken the machine referred to England and used it there with success, as a competent repair man.—Ed.)

The Trade in England

London, Aug. 10.—To the Editor.—Hoping that the experience of an English subscriber may be welcome I take the liberty of suggesting that motor bicycles designed for sale in this country should be equipped with motors fixed to a bed plate similar to the Thomas. This is a strong point as the motor can then be applied to almost any bicycle. The Thomas motor, however, is none too powerful for the Hompstead hills, about the worst we have around London, to say nothing of those in Kent and about the south coast.

Holborn viaduct, once the strong-hold of the bicycle trade, is now filled with automobile stores. There is no great demand for steam cars, though the Locomobile company has done well and many users speak highly of the machine. Most of the operators here, however, look upon steam vehicles as mere toys when they compare their work with what may be done with the gasoline "jiggers" commonly used. To be a ready seller a machine must be able to take the automobile club's certificate of 100 miles without a stop.

A house that has a gear with 8, 10, 12 or 14 horsepower engine, Panhard style of gear, four speeds and reverse, direct drive to back axle or by chains, former preferred, 34 and 32 inch wheels, weighing with 12 or 16 horsepower engine, from 1,300 to 1,600 pounds, can sell it readily.

England is a dozen years behind France in the manufacture of automobiles and we are of the opinion that America is equally backward. Your American speeds are fanciful. Find a Panhard or new Mors and

FROM CORRESPONDENTS.

try its speed with accelerator and you will find it fast enough to frighten any American whose machine can not go faster than tiller steering will take him.—Yours, etc., Will Jennie.

Pump Will Not Hold Pressure

Chicago, Aug. 24.—To the Editor.—I have an auxiliary pump which supplies air to the gasoline tank and water to the boiler. When I leave my machine standing the air runs down. Can you suggest the cause and a remedy?—Yours, etc., M. P.

(The writer, it is assumed, uses a three-way cock to control the steam, air and water. Unless the cock is turned the right way when the machine is at a stand-still the air will leak back through the pump.* No pump is so accurately made as to be proof against 50 pounds of air pressure indefinitely.—Ed.)

Repairers at Albany

Albany, N. Y., Aug. 20.—To the Editor.—It might be of interest to you, and certainly would to your readers, to know that we are headquarters for automobile repairs in this part of the state. We think we have in charge every steam carriage running in this section and are, in fact, in control of the repairs on this class of vehicles here. There is hardly anything used here but steam; only one or two gasoline vehicles, we believe. There is nothing in the line of repairs to a steam vehicle that we cannot undertake. We have experts for expanding boiler tubes, repairing burned-out boilers, overhauling engines and in fact can do any bit of repairing required. We also furnish large quantities of gasoline and cylinder oil, and as our works are only about one block south of the bridge spanning the Hudson and over this bridge all automobilists coming up from New York or Boston or other eastern points must pass to enter Albany, we look for a large trade in this class of work.—Yours, etc., Jas. Goold Co.

Correction of Contrary Gongs

Pittsburg, Pa., Aug. 24.—To the Editor: Probably every user of a Locomobile or similarly equipped vehicle has often had his patience sorely tried by his alarm gong. This is commonly bolted to bottom board at front of body, the plunger rod coming up

through holes in footboard and rubber mat. While running, the least push of the foot will move these so as to jam the rod, and while it will go down, giving a single clang, nothing will induce it, for the time, to come up again, and no further sound can be had from the gong. After the need is past, and while running along an unobstructed stretch, some little move of foot will release the rod, and "clang" goes the gong again, just when one least desires it. Another point; when a tool is wanted from under the footboard, the rod must be withdrawn, and to return it a tedious groping must be gone through before it will enter the lower hole.

To correct all this, I cut off the rod under footboard, leaving only enough projecting above base of gong to allow necessary movement; then screwed to bottom board close to dash the short leaf of a common strap-hinge, in such position that long leaf near its end rested on the rod. On top of this end of leaf I screwed a block of hardwood, high enough to come above footboard from one-half to three-quarters of an inch; took escutcheon plate off footboard, and cut away same to clear block well. The rubber mat was allowed to lie on block, not being cut any. With this in place, the footboard can always be turned up without needing to remove or replace anything, and gong will always respond to foot pressure.

In later pattern gong, having a prolonged tube for rod, it might answer to enlarge hole in footboard, and shorten rod so its button head will come only enough above footboard to give the needed movement. Probably the tube will be sufficient guide for rod to prevent jamming; but this I have not tried. The hinge arrangement has been in use for a year, and never gave any trouble.—Yours, etc., Reader.

What Made the Motor Run?

San Diego, Cal., Aug. 24.—To the Editor.—I have been taking care of a motor cycle for some time for a Jap. He brought it in the other day and wanted me to look it over. I found that the screw which held the small gear on the shaft had the threads stripped. The way I found it out was peculiar. I set the rear wheel in a rack, started the motor, then jumped off to watch the gears. Just as I got off something fell

FROM CORRESPONDENTS.

on the floor. I found it was the small shaft gear, but the engine kept on running just as though nothing had happened. I watched it for some time and finally stopped it to see what kept the contact breaker working. I saw nothing at all to work it and on trying to start the motor again it would not go. After replacing the gear it run very nicely again.

The exhaust is run by another 2 to 1 gear so that worked all the time.

Perhaps someone can tell me through the *MOTOR AGE* what made the motor run without the contact gear running.—Yours, etc., R. N. Corey.

Three Years' Trouble With a Motor

Purvis, Miss., Aug. 17.—To the Editor.—I built a buggy three years ago and bought a gasoline motor from the St. Louis Gasoline Motor Co. I could never get it to run as it should and returned it, as they wrote me that they had gotten up a new igniter that would make it the best carriage engine on earth. They wrote me from time to time that they were at work on it and said I would not know it when it came back. After a year I employed an attorney to go around and have it shipped back. My attorney went around and found them closed out, but finally found one of the workmen who identified my engine. The Acme Gasoline Engine Co. said they would put it in good order and put a new igniter on for \$15. I had it done and in about a month the engine came but would not do any better than it did at first. I failed to get back the fly wheel, spark coil and lubricators so I had these made here.

I had six of Edison's batteries, type Z, and his coil. I concluded that I had not enough batteries, so I added two and re-filled the six and still the motor did not run. Then I bought a new carbureter that I thought would be the right thing, but to no purpose. I tried it today and it did better than it has ever done.

The trouble I have is with the igniter. I cannot get it to explode regularly, and it will only run a few revolutions. The igniter seems all right but at times I cannot get an explosion at all. I have two books on gasoline engines, and am a machinist, and consider that I am capable of understanding machinery. I am general foreman of a saw mill plant here and keep up all the machinery and locomotive.

If you can give me any information that will help me, I will be the most thankful for it.—Yours, etc., Jno. W. Woodward.

[If the motor referred to is, as we suspect, one of those formerly made in St. Louis, having a piston make and break and circuit breaker on the rod which operates the exhaust valve, our experience indicates that it is a hopeless case. Any form of igniter with primary spark, which employs a spring inside the cylinder, or outside for that matter, on an unjacketed cylinder head, will fail because repeated exposure to from 430 to 450 degrees of heat will practically draw the temper from spring steel. A jump spark could be used on this motor if a place could be found on the cylinder head to locate it and the circuit breaker on the motor described used to operate the coil. Will Mr. Woodward please forward details of the kind of coil he is using and whose it is; what form of spark, end on, wipe or spring contact and, unless the description above referred to applies, a more detailed description of the motor, with illustration, if possible?—Ed.]

Useful Suggestions

6.—My motor misfired, stopped suddenly and there was an occasional explosion in the muffler. The vibrator, when tried with the finger, sparked all right. Having tried almost everything else I could think of, I found that the platinum of the vibrator had become loose and so caused irregular contacts. When it had been fixed the motor worked perfectly.

7.—Julius Wilcox, of Brooklyn, suggests as a remedy for the dust trouble, that a larger wheel and higher body would prove advantageous. The suggestion is the outcome of his experience with the high bicycle of early days and the safety in later years.

8.—In connection with the remarks of a correspondent in last week's issue, relative to the inadvisability of applying a motor to an ordinary bicycle, another correspondent says that he was of the opinion that it would be a safe procedure until he tried it and had the front forks give way. He replaced these with heavy ones and was then quite sure he was safe until the frame tube, back of the head, went all to pieces. By that time he was convinced of his error and came to the same conclusion as the other correspondent, namely, that the entire machine needs strengthening to be safe when fitted with a motor.

CHICAGO CLUB'S TOUR TO BUFFALO

The Chicago Automobile Club invites all Automobilists, Whether Residents of Chicago or not, to Join its Tour, Which Starts on Saturday, Sept. 7. Details, Other Than Here Given May be Obtained of C. H. Tucker, Chairman of the Tour Committee, 260 Wabash Avenue, Chicago

As soon as possible after the organization of the party a meeting will be held to discuss any and all matters which the members may consider of interest and which may add to the enjoyment of the tour. There will be no hard and fast rules. The party will consist of ladies and gentlemen for whom no restrictions are necessary. Good nature will prevail. It will be the aim of all to make the tour an enjoyable affair to all participants.

Regular stops have been scheduled for meals and arrangements made for the accommodation of the party, in advance. There will be as many informal stops as members of the party consider desirable.

At places indicated as stopping places for lunch arrangements will be made for light refreshments only, affording an opportunity of a few moments' stop and to round up stragglers.

The hotel expense of the entire trip of nine days will be, approximately, \$25 for each person.

An attempt has been made to keep the distances within the capabilities of all. It has been necessary, however, in considering the hotel accommodations and other matters, to make some days' runs longer than others. The route is, at all times, within easy distance of the railroad so that, should any of the ladies of the party consider it desirable, they may take the train for a part of the route and rejoin the tour at any convenient spot.

Entertainments

Of these there will be many. It has been the experience of the promoters of this event that tourists are never at a loss to provide an abundance of amusement for leisure moments. The informal part of the programme will be arranged at the meeting

before referred to and at such times thereafter as the members of the party desire. In short, there will be little formality and lots of fun.

LAPORTE, IND.—Here the freedom of the Elks' club room has been extended and the party will be taken in charge of by Mr. E. J. Lonn, who will take pleasure in rendering all the assistance possible to make the evening enjoyable.

TOLEDO, O.—The arrangements have been undertaken by Mr. E. H. Hubbell, a guarantee that there will be a programme to delight every visitor. Reference to the schedule will show that arrangements have been made to arrive at Toledo early in the day. After dinner at the Boody House the following pastimes are offered:

1. President Coleman, of the American Bicycle Co., has invited the party to visit the Toledo steam vehicle factory and learn how steam automobiles are made. Superintendent Morgan will take charge of the party and Mr. Coleman has promised, if his engagements in New York will permit, to be present in person.

2. The Farm, a grand place to dine and, after dinner, to attend the vaudeville show as given there every evening.

3. The Casino, another vaudeville entertainment.

4. A trip by steamer Pastime, to the lake, a trip in which the ladies would be much interested.

5. The Country Club. A stop will be made here on the way into Toledo.

The party will be met at Perrysburg by a party of Toledo people and escorted into town, stopping on the way at the Country Club. A number of Toledo people expect to join the tour at that point.

Mr. Hubbell has kindly undertaken to make all the arrangements necessary in Toledo and will probably proceed with the tour to Buffalo.

CLYDE, O.—The Elmore Mfg. Co. has extended an invitation to visit its factory and witness the manufacture of gasoline vehicles.

CLEVELAND, O.—The party will be met at Elyria by a number of Cleveland automo-

CHICAGO CLUB'S TOUR.

bilists. Headquarters will be at the Hollenden. The Winton company has invited the party to visit its factory and witness the manufacture of the celebrated Winton vehicles. Arrangements for the remainder of the day have not been completed.

BUFFALO.—Ellicott Evans, secretary of the Buffalo Automobile Club, will take care of the promotion of a party to ride to North Evans and welcome the tourists. The rooms of the club will be open to the visitors during the stay in the city.

It is not deemed expedient to attempt to keep the party together after arrival in Buffalo. It will be possible, no doubt, to arrange a number of meetings there, but the prevailing opinion seems to be that for the greater part of the time each participant in the tour will prefer to go as he or she pleases. Some of those who will make the trip have talked about returning by road. This is a matter which will be discussed during the tour.

Roads and Points of Interest

The following reports have been received concerning the condition of the roads along the route and points of interest which might be visited:

LAPORTE, IND.—The roads are fine, especially east of us. Of course, later in the summer they may be somewhat dusty.

NEW CARLISLE, IND.—The roads to South Bend good, gravel and sand, mixed. No hills; no mud.

SOUTH BEND, IND.—Direct road to Laporte hard and good; no hills. Largest plow works and carriage factory in the world. The management will be glad to entertain the party. University of Notre Dame, largest Catholic institution of its kind in America, also St. Mary's academy within a mile of Notre Dame. Oliver Chilled Plow Works, largest plow factory in the world; Studebaker Bros., largest vehicle manufacturers; Singer Sewing Machine Co., wood-working plant.

ELKHART, IND.—Road good east and west, of gravel; no hills. Scenery along the Elkhart and St. Joseph rivers is unsurpassed.

GOSHEN, IND.—Roads generally good, of gravel; no hills. Wawasee Lake, a summer resort, about 15 miles southeast.

LIGONIER, IND.—Roads in grand condition.

GENEVA, O.—President Carter, of the Geneva Automobile Co., extends the free-

dom of his factory and will proceed with the party to Buffalo.

KENDALLVILLE, IND.—Roads good and solid. No sand. From Elkhart to Cleveland by way of Toledo there are few hills. What few there are are just east of this place and cut no figure. You could not wish for a better road. Rome City, a summer resort, 7 miles north, is extensively patronized by Chicago people. There is good boating and fishing at a small lake near.

MELBERN, O.—Between this point and Bryan there are a few hills, but the road is good and you will have no difficulty.

BRYAN, O.—Roads good, striking hard roads just after leaving Edgerton. A little rough after rain, but only lasts a day or two. Clay and gravel. For pleasure follow the river from Napoleon to Maumee, crossing there to Perrysburg. Take the old government stone pike to Fremont. The first object of interest after passing Napoleon is Turkey Foot rock.

FREMONT, O.—For 30 miles in either direction we have state roads and they are in good condition.

CLYDE, O.—Roads always good; stone and gravel. Summer resort called Green Springs here.

BÉLEVUE, O.—Roads generally level and in good condition. Most of them are the state pike. We are within 15 miles of Sandusky and Cedar Point, a delightful place to spend a day. Good boating, fishing and bathing beach. Green Springs, near here, is the finest sulphur water spring in the United States.

NORWALK, O.—Roads generally dirt, with no hills worth mentioning. Only hills are at Creek and River Valley. Cedar Point is three miles by boat across Sandusky Bay. Thomas Edison's birth-place is three miles away, at Milan.

OVERLIN, O.—Roads good; no sand or hills to speak of. The historic Oberlin college is located here.

ELYRIA, O.—Roads generally good and no hills.

CLEVELAND, O.—Roads good to Ashtabula. Not so good from Ashtabula to Girard, but fine from Girard to Buffalo, except 10 miles in the Indian Reservation 30 miles from Buffalo.

ASHTABULA, O.—The Grand Trunk road is sandy, but otherwise good. Roads further south of clay and excellent when dry.

CHICAGO CLUB'S TOUR.

No hills. The greatest iron ore port on the lakes. Only four hills amounting to much between this city and Buffalo.

PAINESVILLE, O.—Roads fair; clay and fine gravel and perfectly hard. The most beautiful country along the route.

GENEVA, O.—Roads fine, sand and gravel; no hills.

GIRARD, O.—Roads all dirt and smooth. No hills worth mentioning. There is a severe hill entering this town—the worst between Cleveland and Buffalo.

FAIRVIEW, O.—Steep hill leaving here.

ERIE, PA.—Look out for State Line Hill, 20 miles west. Good sand and gravel roads. No hills if you follow the lake. Party of automobilists will ride out and meet the tourists.

NORTH EAST, PA.—Roads good and level to Buffalo. One small hill. Fine bathing beach, trout ponds and mineral springs 15 minutes' walk. Center of the fruit and grape district.

The Route in Detail

Showing the railroad mileage between towns.

Saturday, Sept. 7, Chicago to Laporte, 69 miles. Start 9 a. m.

Chicago	0	Chesterton	3½
Hammond	21	Burdick	4
Hessville	4	Otis	4
Glen Park	7	Durham	4
Hobart	3	Laporte	6
Crocker	8		

Sunday, Sept. 8, Laporte to Ligonier, 71 miles; total 140 miles. Start 8 a. m.

Prairie	7	Osceola	6
New Carlisle	7	Elkhart	5
Terre Coupee	1	Dunlap	5
Warren	5	Goshen	5
South Bend	7	Millersburg	8
Mishawaka	4	Ligonier	7

Monday, Sept. 9, Ligonier to Napoleon, 61 miles; total 221 miles. Start 8 a. m.

Mewaka	5	Edgerton	7
Brimfield	4	Melburn	5
Kendallville	7	Bryan	6
Corunna	7	Glenburg	6
Sedan	2	Evansport	2
Waterloo	4	Domerville	5
Butler	8	Napoleon	10

Tuesday, Sept. 10, Napoleon to Toledo, 41 miles; total 262 miles. Start 8 a. m.

Grand Rapids	13	Presque Isle	5
Bailey	6	Perrysburg	5
N. Washington	1	Toledo	10

Wednesday, Sept. 11, Toledo to Norwalk, 64 miles; total 326 miles. Start 9 a. m.

Stony Ridge	12	Clyde	8
Lemoyne	24	Bellevue	8
Elmore	9	Monroeville	7
Lindsey	5	Norwalk	5
Fremont	7		

Thursday, Sept. 12, Norwalk to Cleveland, 55 miles; total 381 miles. Start 8 a. m.

Collins	6	N. Ridgeville	4½
Wakeman	5	County Line	3
Kipton	5	Olmstead	2
Oberlin	5	South Dover	2½
Elyria	9	Rock Riv. Bridge	3
Town Line	2	Cleveland	4½

Friday, Sept. 13, Cleveland to Conneaut, 70 miles; total 451 miles. Start 9 a. m.

Case Ave.	2	Painesville	6
Glenville	3	Lane	1
Coits	1	Perry	2
Collinwood	1	Madison	5
Nottingham	2	Unionville	3
Noble	3	Geneva	3
Wickliffe	1	Saybrook	4
Rush Road	1	Ashtabula	5
Willoughby	4	Kingsville	6
Reynolds	3	Amboy	4
Mentor	2	Conneaut	3
Heisley	3		

Saturday, Sept. 14, Conneaut to Dunkirk, 79 miles; total 530 miles. Start 9 a. m.

Springfield	8	North East	4
Girard June	5	State Line	5
Girard	1	Ripley	3
Fairview	4	Westfield	7
Swanville	3	Portland	7
Erie	8	Brocton	2
Wesleyville	4	Van Buren	4
Moorhead	3	Dunkirk	5

Sunday, Sept. 15, Dunkirk to Buffalo, 41 miles; total 571 miles. Start 9 a. m.

Waites Crossing	5	North Evans	2
Silver Creek	3	Wanakah	2
Irving	4	Bay View	6
Farnham	2	West Seneca	4
Angola	4	Buffalo	4
Derby	5		



SPLENDID TOURING IN IRELAND

A splendid time, indeed, seems to have been the fate of those fortunates who took part in a recent tour of Ireland, promoted by the Automobile Club of Great Britain. There were only 15 carriages at the starting point, but they carried several celebrities. The party started from Dublin. The Panhards and Damlers, says the Irish Cyclist, set a clinking pace. The cars quickly placed large gaps between each other, as the dust though not excessive, was quite sufficient to make combined traveling unpleasant. Under all circumstances, indeed, it must be said that motor cars must give each other a wide berth in touring.

Our first mishap was a puncture to one of our huge Michelin tires. This was repaired after about half an hour's delay, during which time Harvey DuCros whizzed past us again, having taken a wrong road some distance back. He was in pursuit of Jarrott, who was well ahead and working his Panhard to a very pretty pace. These two cars were simply full of speed, and on unfrequented bits of road they had some rare "dust-ups." Harvey DuCros is a cool and clever driver and daring to a degree; and Jarrott—well, he was one of the Paris-Berlin men. The curly roads gave them many calls for fine steering, and thrilling inclinations to "travel on their ears," to use a racing phrase. The more sedate touring cars followed at a more pleasurable if less exciting pace. The latter portion of the run to Borris and Graiguenamanagh was particularly delightful. Splendid roads and entrancing scenery were our lot. During a fit of the slows we were overhauled by V. Grace on a hard-working Ariel tricycle, to which was attached a trailer, wherein lolled Page Dickenson of polo fame, wearing an air of ineffable calmness and coolness. Grace is an industrious man, and he worked himself blue to beat us up hill and down dale, the reward being the consciousness that he was smothering us in dust. They were a quaint pair and prime favorites with the country people, who always like to see the "little wan" winning. That Ariel did extraordinary things in speed and steering. It was hair-raising to see Dickenson tilted

back in his flimsy rickshaw, his heels planted up almost under Grace's ears, whilst the latter whisked round sharp corners. There were no mishaps to chronicle after the day beyond some domestic fowl, which suffered sudden fates. Irish poultry have not yet correctly estimated the peculiarities of motors.

Next day's destination was Cork, and a start was made about 10 o'clock. A splendid stretch of road led to Dungarvan, and we all felt so grateful to the country surveyor, who had got this route into such splendid order. As we got into the south the people grew more and more kind-hearted, and we were cheered to the echo by every little wayside group. The road surface, however, deteriorated as we reached the city by the Lee, and the last few miles were abominable. Cork city has dreadful streets and fearfully confused traffic. As we covered the last half mile rain set in, and those of the cars which arrived later on caught a heavy drenching.

Rain fell steadily during the night, and it boded ill for the morrow. But when we came down to breakfast next morning there was a sunny greeting in the sky and the promise of dustless roads. Of bumpy surface they were for many miles, however. We were rewarded by good scenery and a pleasant day; and when we came to climb Keimaneigh there was nothing to detract from our contentment. The scenery through the pass is glorious, and we had a continual feast of ever varying enjoyment as we throbbed towards Glengariffe. All these miles and miles of roadway were almost deserted. We scarcely met a cycling tourist.

The heavy climbing had divided up the cars very much, and Glengariffe was not reached by many of the cars till a late hour.

The second last stage up amongst the hills to Kenmare and then down the winding slopes was thrilling in the grand swoops round right-angled corners. Even more exciting was the final dash down on Killarney from Windy Gap. A good driver who can take these snaky corners at speeds very close to the margin of safety treats his passengers to creepy sensations.

TOURING IN IRELAND.

Portion of the party halted at Kenmare, intending to branch off for Derrynane. We were now an attenuated and much divided party.

Urging Use of Metric System

While the needs of the commercial world long ago convinced business men of the desirability of an international standard of weights, measures and money, nothing, perhaps, has so thoroughly and so persistently placed the matter before the general public as automobilism and cycling. Happily steps are being taken which must, sooner or later, result in success. Commenting on the subject the Journal of Commerce says that Russia took preliminary steps nearly a year ago looking toward the adoption of the metric system. It is a little odd that of the four nations most aggressively reaching out, in one way and another, for foreign trade, Germany alone has established the international system of weights and measures. Russia probably has decided to do the same thing; in England and America most of the argument, practical as well as theoretical, is in favor of adopting the metric system, and the change is prevented mainly by inertia. The consuls of both countries have testified that their foreign trade was injured by the non-adoption of the metric system, and in England a large amount of testimony favorable to the change has come from manufacturers and merchants. In Germany the change was effected quickly and with very little trouble. Possibly the expansion of German foreign trade has been promoted by the change. The Pittsburg Chamber of Commerce is urging concerted action by the United States, Great Britain and Russia for the adoption of the metric system. Replies from commercial bodies all over the country favorable to it have been received, and communications to this end have been made to commercial bodies in England and Russia.

Need of a Kerosene Burner

There is no great demand for a kerosene burner in this country. Gasoline is so cheap, compared with other fuels, that users have found little cause to complain. But in Europe, where gasoline costs about 30 cents a gallon and the expense of operating a steam

vehicle is about four times as great as in America, it is not surprising that there is an outcry for a burner which will burn the heavier grade of oil. The time will come, even in this country, when the user will begin to appreciate the greater amount of heat in kerosene and its greater economy, for though in the early stages of automobilism users are generally willing to spend money somewhat freely, the eventual perfection of machines will give them time to think of something beside the troubles they now encounter and cost of operation will be one of the first things considered.

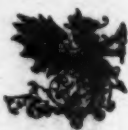
Writing on this subject, an English correspondent says that no machine is complete without a feed-water filter, a condenser and a kerosene burner. Another says that he has designed and thoroughly tested a burner from which there is no smoke, smell or noise. It is not, he says, made on the Clarkson principle, recently illustrated in this paper, but he cannot give details at present, owing to the fact that patents are pending.

Many American makers have experimented with kerosene burners and some of them claim to have attained success. So far, however, no prominent manufacturer of automobiles has been able to satisfy himself of the success of these devices. Something in the line of a device about whose success there is no question would be welcomed by the trade and meet with ready sale.

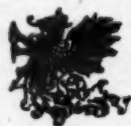
A Revolutionary Principle

Franz Burger, of Fort Wayne, Ind., a man who has done a vast amount of gasoline engine work, has lately designed one which is based on quite different principles from those in general use. In this new engine compression of the vapor in the usual way is obviated. An air tank is provided in which air is compressed to about 100 pounds pressure.

The plan of the designer is to admit air and gasoline vapor during about two-thirds of the stroke, and to consume them in the cylinder, obtaining power by comparatively gradual expansion of the air rather than by the sudden explosion which commonly occurs. The application of the motor to automobiles is among the remote possibilities.



INFORMATION FOR BUYERS AND BUILDERS



Andrew C. Thompson of Plainfield, N. J., is manufacturing an electric runabout remarkable for its lightness and neat appearance. The running gear is of peculiar design, with arched axles, and resembles considerably the style of horse-drawn runabout so popular for light city service. The motor, together with the differential gear, is mounted in a steel casing, which is attached to the rear axle by hinged joints, and to the reaches by a spring designed to relieve the strain and jarring when starting or on rough roads. Extra strong 28-inch wire wheels are used, fitted with 2½-inch pneumatic tires. This style, equipped with a 20-cell Porter battery, capable of a 25-mile run on one charge, weighs 550 pounds; and when equipped with the same make of battery capable of a 60-mile run on one charge, 650 pounds. It is equipped with combination volt-ammeter, electric headlight and an electric gong operated from a push button in the end of the controller handle. The manufacturer has carefully tested this carriage during the past year with satisfactory results. The tests have been most severe. The price, with batteries of 25-mile capacity, is \$800, with an additional cost of \$75 when the long-distance batteries are supplied.

Mr. Thompson also manufactures a stanhope, equipped with a 40-cell Porter battery and capable of a 125-mile run on one charge, with a speed of 20 miles per hour, under favorable conditions, which weighs 900 pounds and sells at \$1,000.

Machine Shop Furniture

The New Britain Machine Co., New Britain, Conn., makes a line of machine shop furniture such as tool racks, lathe pans and shelving in iron and steel. The claim is made that "a place for everything and everything in its place" is exemplified in these useful articles, unobtrusive but ever

at hand, presenting the right tool at the right place at the instant required and so insuring the greatest saving and service for a small outlay. The racks allow of frequent changes in position to bring tools, work and workman constantly into the handiest relations. Work in progress may be kept on the rack and moved from one department to another, or taken from stock



to assembling room. Ball bearing swivel casters are used in the larger racks and lathe pans to enable heavy loads to be "faced" about and moved with ease. Ease of movement is of much importance, making the pans easier to clean and in other ways better than those which are part of the lathe. Pans of all sizes are supplied, as are shop shelves and tool racks. The company issues a neat little book covering points of interest.

The Quad Gas Engine

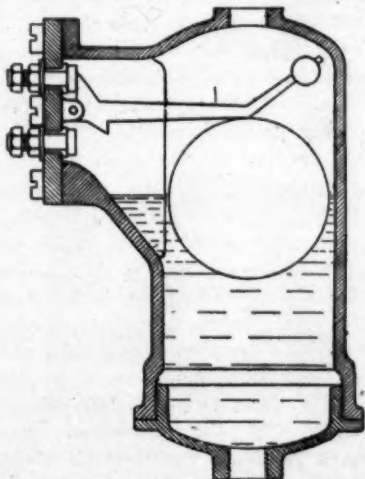
One of the most compact four-cycle gasoline engines on the market is the Quad, manufactured by the Inland Manufacturing Co. of Chicago. It has four cylinders, water jacketed and double opposed; that is

INFORMATION FOR BUYERS.

to say, set in pairs facing each other at opposite ends. The combustion chambers and all valves are on top, between the cylinders. The crank-shaft is set at 180 degrees and runs on three bearings. The ignition is by jump-spark, and there is attached to the engine a stationary commutator with revolving brush, the commutator being fitted with four segments, one for each of the cylinders. By this method but one coil is required instead of one for each cylinder as commonly used. Speed is controlled by the spark and by throttling the intake. - The engine is extremely light, the 3-horsepower pattern weighing but 100 pounds, with fly-wheel. The dimensions are: Length, over all, 21 inches; width, 14 inches; height 12 inches. The 6-horsepower engine weighs 160 pounds and is but little larger than the 3-horsepower.

Automatic Boiler Feed

The Reliable Automatic Boiler Feed Co., 29-31 Cortland street, New York, is supplying an automatic boiler feed that warrants investigation. It has no stuffing-boxes, and no mechanism working through a pressure area. The float develops no power and is practically only required to float its own weight. The pump is thrown out of and into service by an iron clad magnet, which is required to do no work except support

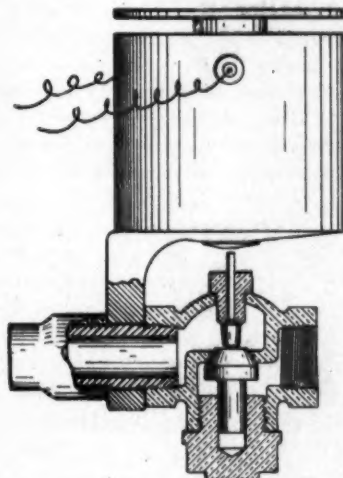


its own armature when energized. It does not lift or move a valve, but simply holds one off its seat after the pump lifts it. Should water get low from any cause the regulator gives certain alarm.

The device is simple and easily attached

to any automobile. It does not interfere with the present method of regulating the feed, while it eliminates the necessity of constantly watching the water-glass, and it does not require a change of the pump connections except in substituting a suction valve for the one in use.

The entire outfit consists of a float chamber, with float therein, all ready for attaching to boiler; a $\frac{1}{4}$ inch check valve for replacing the suction valve on the pump, with magnets attached for holding the



valve off its seat; two cells of dry batteries for energizing the magnets or sounding an alarm, and a small electric bell. It does not interfere with the old method of regulating feed by hand, and if an accident disables the automobile on the road, all there is to do is to work the by-pass or resort to the old method until it is repaired.

The idea is the result of exhaustive tests by the makers. This paper would be pleased to receive reports from users of this and other articles of similar character. The device is handled in Chicago by the Automobile Equipment Co., 21 Quincy street.

The Jones Boilers

William Jones, of Ravenna, O., is manufacturing for the trade a boiler for steam carriages. This boiler is 16 inches in diameter, with seamless steel shells, and contains 360 half-inch seamless copper tubes. It is tested to 600 pounds hydrostatic pressure before shipment. He also makes a burner designed for this boiler, but adaptable to any of the usual type. It is made

INFORMATION FOR BUYERS.

of cast-iron or bronze. The only size at present in stock is 16 inches, but Mr. Jones is prepared to make any other size to order. The 16-inch size contains 180 half-inch seamless copper air tubes, around each of which is drilled 20 small holes for the vapor outlet.

New York Tires as Weight Carriers

That the New York vehicle tire, made by the New York Belting & Packing Co. stands up under severe test is evidenced by its work on the Red Rover, the powerful Gasmobile which runs between the Waldorf-Astoria and Manhattan Beach. This vehicle carries eight passengers and the profits have been kept down by the cost of replacing tires. The distance traveled each day is from 30 to 35 miles, yet few of the tires lasted over two or three weeks. Recently the owners of the vehicle were induced to fit the New York tire to the rear wheels, the channels of which were dented and twisted by running the machine with flat tires. Notwithstanding this handicap, Frank P. Hayes, of the New York Belting & Packing Co., says his tires have lasted longer than any others heretofore used and that they are still in use, apparently as good as ever.

Shells, Tanks and Tubing

Among the largest manufacturers of seamless, cold-drawn steel shells, cylinders, tanks and specialties are Janney, Steinmetz & Co., of Philadelphia. So complete are their facilities that they have recently issued a sheet of illustrations of a large number of articles with a line at the bottom which says: "If you don't see what you want, ask for it." They are devoting particular attention to seamless steel tanks and boiler shells, adapted to automobiles. They are also prepared to make steel forging of any design. Their output, particularly in the matter of motor carriage appurtenances, is largely marketed by C. E. Miller, New York.

The Holtzer-Cabot Igniter

There is probably no user of a gasoline engine, regardless of the style or the purpose thereof, who has not had more or less trouble with ignition, and this condition of affairs has led the Holtzer-Cabot Electric Co., of Brookline, Mass., to add to its regular

line of dynamo igniters a smaller pattern, particularly applicable to automobile engines. This machine differs little from the company's standard pattern, except in dimensions. It has an armature of the drum type, similar to that used in direct current dynamos. It has permanent magnet fields so that no current is wasted to energise them and a wider range of speed may be employed without danger of a 'burn-out.' It is strong in mechanical design, is equipped with steel shaft, large grease cups and extra long bearings. The armature and commutator are completely enclosed and are stated to be dirt, oil and moisture proof. The device is made in both upright and horizontal types and operates most satisfactorily at a speed of from 1,500 to 2,000 revolutions per minute. With the magneto igniter, as well as with the battery, a spark coil is necessary, and the company has devoted much attention to the development of a specially wound coil from which it guarantees satisfactory results.

The Lincoln Re-charging Motor

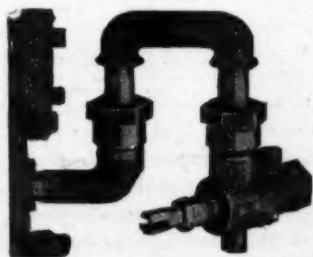
One of the neatest and most compact electric motors for carriage use now on the market is that manufactured by the Lincoln Electric Co. of Cleveland. It is entirely enclosed and dust proof. The cast steel magnet frame is constructed with in-turned ends to protect the field coils. To each end of the cylinder thus formed are bolted the yokes that carry the bearings. Each yoke is fitted to a shoulder turned in the end of the magnet frame so it cannot avoid being perfectly central. Each yoke carries a bearing for the armature shaft, and one carries the rocker and brush-holder. A light and conveniently shaped aluminum cover is provided for this part of the yoke in order to allow easy access to the brushes. The commutator is long and provides the generous brush surface. The motors are of the four-pole type, provided with ball or oil bearings, laminated pole-piece of peculiar shape that gives an excellent distribution of magnetism over the pole-piece, barrel wound armature and adjustable brush-holders arranged for graphite or carbon. The company is building two types adapted to automobiles, one of the ordinary series-wound, the other specially wound. The series-wound motor needs no special description, as it is similar in design and con-

INFORMATION FOR BUYERS.

struction to many others. The second type is peculiar, so arranged that it is changed into a dynamo and charges the battery whenever the carriage is running down hill or the speed is being reduced. The principal feature claimed for it is that the average efficiency is much higher than usual, particularly under light loads. It is generally admitted that a carriage driven by a series motor requires from one-half to two-thirds as much current running down a slight grade as when running on a level. When a carriage is running down a one-half to one per cent grade, for instance, the load is much less than when running on a level, but the current required is but little less. It is, however, claimed by the manufacturers that this new motor takes current strictly in proportion to the load. The makers also claim that a carriage driven by a series motor, built by a well-known firm, required 13 amperes to carry it down a certain 4 per cent grade, while the same carriage, equipped with one of the above described motors, descended the same grade and charged the batteries 20 amperes. The change of the machine from motor to dynamo is entirely automatic.

More Dayton Improvements

In steam carriages the engine must be hung in such manner as to permit taking up any slack in the driving chain. This fact renders a flexible connection between the throttle valve and engine absolutely essential to good practice. The desired object is accomplished satisfactorily by using the Dayton lever throttle valve and flexi-



ble double joint connection here illustrated.

It is made of the best quality of steam metal and is provided with a large stem and long packing gland, steam passage of ample size, and extra lugs for a brace for fastening to carriage and for pop valve con-

nection, thus avoiding the necessity of tapping an extra hole in the boiler. The flexible double joint connection is provided with carefully ground and packed swinging joints which, while flexible, are steam tight. The two articles are sold separately, and the double flexible joint connection can be used with any throttle valve. The manufacturers are the Dayton Motor Vehicle Co. of Dayton, O.

The Joseph Dixon Crucible Co. has issued a pamphlet containing a number of letters from users of automobiles who have used Dixon's graphite and speak highly of it. The pamphlet is of value because it relates the experience of users with various parts of their machines and therefore supplies information as to the parts on which graphite can be used advantageously. The company's address is Jersey City, N. J.

The Central Mfg. Co., Connersville, Ind., manufactures carriage bodies for the trade. It does not cater to small or sample orders, but prefers to deal with the larger lines of manufacturers, who get up their own designs and specify a given number of each of the different styles required. The company treats each style as the exclusive property of the concern for whom it is manufactured.

One of the most complete lines of carriage hardware, covering, in fact, nearly every metallic fitting, is that handled by the Eberhard Mfg. Co., of Cleveland. The company has, up to this time, paid no particular attention to fittings of motor vehicles, but its line covers all small parts, such as braces, yokes, steps, body loops and hangers, spring clips, etc.

G. H. Lounsbury & Sons, Cincinnati, are specializing an extensive line of carriage trimmings, particularly in the way of linings and the smaller accessories, such as binding, fancy nails, etc. They are also putting out a button machine to make buttons for tufting purposes to match the trimmings.

The Tuthill Spring Co., Chicago, has for some time been devoting particular attention to the manufacture of springs for motor vehicles. This company has been in business over 20 years and feels that it is fully prepared to manufacture as good a line of springs as it is possible to make.



CYCLE SPORT AND TRADE



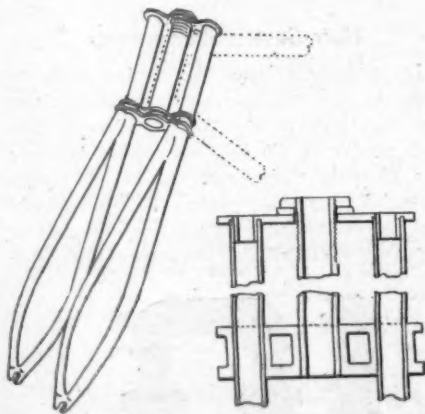
Builders of cheap bicycles have just two years and three months in which to grow rich out of their exports to Germany. For four years German makers have been agitating for an increase in the tariff. The makers' association went into spasms in 1897, had a still more violent fit the following year and has never ceased telling the law-makers that the German cycle industry was being ruined by the competition of American makers. They have not hesitated to do some dastardly things to carry their point and exclude the hated Yankee goods. Dealers have been forbidden to handle them and many underhand things have been done to mislead the public as to the merits of the American machine.

Finally, the makers have carried their point and the German public will be compelled to pay more money for the cycles they will ride. * On January, 1904, a new law will go into effect. The increase on bicycles and finished parts thereof to 150 marks (\$33.70) per 100 kilograms will mean that an American bicycle weighing, approximately 22 pounds (10 kilograms) will pay \$3.57 import duty instead of about \$1.25 as heretofore. This is expected to exclude cheap bicycles, but not good ones.

Forks for Motor Bicycles

The weak spot of the safety bicycle is, and always has been, the front forks. How many accidents have happened from forks which have broken near the head will never be known, but some of the most serious smashes known to the sport have been due to this cause. The average cycle, when made, is strong enough to stand many times the strain ever likely to be placed upon it. The tests of the makers prove this to be the case. But with the first ride the forks commence to deteriorate. Vibration is responsible. The vibration is carried up the fork until it meets the lug. The result is a severe

shock, or rather innumerable shocks, at that point. Disintegration of the metal results and in the course of time it breaks. So far this has been due to the vibration caused by the inequalities of the road. To this must now be added the vibration of the motor, kicking at from 1,000 to 2,000 revolutions a minute. The rider, who formerly propelled the machine, eased it over obstructions. The motor will not. Instead it will pound away as energetically when the front wheel encounters a brick as it will on smooth asphalt. No great amount of discernment is necessary, therefore, to see that the strain on a machine is far



greater than was formerly the case, and that added strength is essential to safety. Various designs have been used, some good, some indifferent and some bad, to brace multicycles and pacing machines. The time will come, probably, when every machine will have larger, or a greater number of tubes than are used in front forks at present. From an esthetic standpoint a single tube is of course best. Whether the same remark applies when the safety of life and limb are concerned is another story.

Several new patterns of trussed or other-

CYCLE SPORT AND TRADE

wise braced front forks have lately been designed. One of the latest is that of A. J. Meunier, of Cleveland. It does not differ materially in external appearance from several in common use. Its principal distinction is in the method of attaching to the bicycle and construction at the fork crown. The fork stem is rigidly attached to the crown-plates and projects through a third plate resting on the projecting end of the fork sides. This plate is removable and in attaching the fork to the frame it is removed, allowing the fork stem to be seated in the frame in the usual way, after which it is replaced, being locked in position by means of a lock nut on the fork-stem.

Garden Leaves the Cycle Trade

The one person whose name is revered above all others by Chicago bicyclists of the old school is Bob Garden. True, his initials are R. D., but no man who knows him ever thinks of that. He is one of those kind-hearted creatures to whom no one ever refers except by some term of endearment and in this case it is plain Bob.

After a connection extending over the greater part of 20 years Garden is about to sever his relations with the cycle trade. He was with the Weed company in the early days when it made the Columbia for Colonel Pope. He followed the fortunes of that machine through its palmy days and became manager of the Chicago branch. There he attained such popularity as was never the lot of any other man in the trade in any capacity. In course of time the calls of business took him back to the factory and thence to Philadelphia, where, for the last six or seven years, he has been engaged in business on his own account. But he feels that the cycle trade in that city has had its best day and is not content to continue on a small scale in a business in whose phenomenal rise he took so active a part.

No definite plans have been made. He will close out his store at once and after a reasonable rest, will seek occupation in some other field. Many friends in Chicago will hope that his future plans may lead him to return to the scene of his greatest triumphs. He has had a good taste of the automobile business during the last two years and if his services could be obtained as manager

of a big Chicago store it would be the best possible investment for a manufacturer who contemplates anything of the sort to make. Mr. Garden may be addressed for the present at Ninth and Arch streets, Philadelphia.

Gas in the Handle-bars

An odd idea in acetylene gas generators for a bicycle lamp has been recently patented by E. N. McNamara and J. D. O'Rielly, of Chicago. The handle-bar is utilized, one-half containing the carbide and the other the water. Arrangements for regulating the flow of the water to the carbide chamber are located in the ends of the handle-grips. The combustion chamber, etc., are clamped around the handle-bars. The illustration of the device is pleasing in appearance, but its practicability in use is questionable.

Plans of the Cycle Makers

The Bretz Cycle Mfg. Co., Syracuse, writes as follows: "Our models for next season will be complete within the next two or three weeks. We will have some strong lines, introducing new features which we believe will prove popular. We are not quite yet ready to make a definite announcement."

"We are making all preparations to go right ahead for 1902," says Ezra Kirk, of the Kirk Mfg. Co., Toledo. "In fact, our samples are now out and we have shown them on the road and have already secured some 1902 business. We are very well satisfied that the line is the equal of anything we have ever produced. While we have not made any radical changes, we have made enough to warrant the statement that everything we offer for 1902 is new. We are very fortunate in closing out practically all of our 1901 stock and go to the trade next year with an entire new line. Our line will be as comprehensive as ever, including juveniles; a popular pried machine; a roadster; the lightest racer we have ever built; cushion frame chain driven bicycles and chainless goods in both cushion and rigid frames. We are much gratified at the success we met with the past season in marketing our juvenile bicycles and shall continue this line for 1902."

At a recent meeting of the directors of the Julius Andrae & Sons Co., at Milwaukee, the question of next year's business

CYCLE SPORT AND TRADE

was considered and a decision arrived at to push the bicycle department vigorously. The company will soon be ready to announce its line for 1902.

The Wisconsin Wheel Works, Racine Junction, Wis., is not quite prepared to give details of its line for next year, but will be in it with a full line of regular bicycles and a motor bicycle which it hopes will place it at the head of the procession. The company intends to push its line stronger than ever.

The Steffy Motor Bicycle

The motor bicycle, constructed by the Steffy Manufacturing Co., Philadelphia, differs materially from other machines now on the market. In several ways it is almost directly opposite, in its system of operation, to any of the others in general use. The feature most noticeable on this account is that the motor is water-jacketed. The water tank is triangular in shape and located in the space between the seat mast tube and the rear stays. It has sufficient surface to radiate the heat sufficiently to prevent burning or vaporizing of the cylinder oil. Another point of difference is in ignition, which is of the touch and break type, using a primary coil. After careful tests, the company has adopted this style as being reliable, easy to understand and handle by an experienced person. For power transmission a chain is used, running from the motor to a large sprocket located just outside the sprocket to which the regular driving chain is attached. The motor is extremely narrow, and if desired the entire equipment can be covered by a neat case, enclosing all parts except muffler. The company also manufactures an air cooled motor of neat design of $1\frac{1}{2}$ indicated horsepower, which weighs 20 pounds. A feature on which the manufacturers lay particular stress is the solid steel one-piece crank-shaft, on which are seated the crank discs or fly-wheels.

Where Cycle Trade Flourishes

H. W. Koehler, manager of the DuQuoin (Ill.) Gun & Cycle Co., an ardent believer in this paper as a disseminator of information of value to everyone in the cycle trade, writes that his concern has become interested in motor cycles, and will proceed to build one in the near future. "Our

business is almost exclusively in cycles in the summer," he says, "and we run a complete repair shop in connection with the store. Our shop is fitted for first class work, and we have been making machines for the last five years. This season has been a splendid one in \$25 machines, and high grades have also sold well. There have been 200 machines sold in this town this season. We are adding a complete plating plant. During the winter we shall carry a line of musical instruments, talking machines and sporting goods. We regard that as the best way to get successfully through the winter. We will soon forward a number of hints which we believe will be interesting to brother repair men. No bouquets intended, Mr. Editor, but don't stop our copy for a single week. We learn a great deal from it and believe that the concern which fails to take it is losing money in consequence."

Acme Plant Dismantled

The information that the Acme plant, at Reading, Pa., was to be dismantled was given to readers of this paper three or four months ago. The factory has now been formally abandoned as a cycle plant, and all the machinery shipped to the Crawford works at Hagerstown. The Acme plant was one of the largest producers of cheap machines in years gone by. It was also one of the first to cause the price-cutting evil by reason of its immense sales of machines to catalogue houses at low prices. The owners were sharp enough, when the sale to the A. B. C. took place to so arrange matters that their property realized a fair sum in cash and are, at this time, free of stockholding.

A New Two-Speed Gear

The English cycle press is agog over a new two-speed gear, the invention of W. D. Wansbrough, a gentleman well known to the cycle trade of England. This gear, which is named the Paradox, is a radical departure from anything hitherto presented. It has only one gear wheel, but this by a very slight manipulation, is changed from a large gear wheel to a small one or vice versa, the difference being $28\frac{1}{2}$ per cent. A marvelous yet simple part of the invention is that though the same gear or chain wheel is enlarged or contracted to

CHAIN TRANSMISSION OF POWER IS SATISFACTORY

ONLY when frictional rivet surface and tensile strength are large in proportion to the working load.



NO. 35 FOR LIGHT RUNABOUTS

Equip your machines with large chains and avoid trouble.
Diamond Chains have large nickel steel hard rivets, are accurate and highly finished.

The Automobile and Cycle Parts Co.

DIAMOND CHAIN FACTORY
INDIANAPOLIS, IND.



THE GOODYEAR
PUNCTURE PROOF TIRE

OUTWEARS

ALL OTHERS

The Goodyear Tire and Rubber Co.

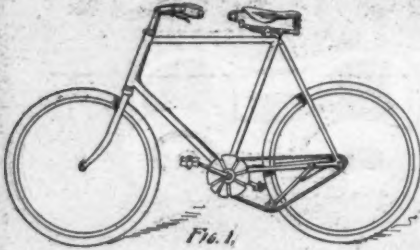
AKRON, OHIO.

LARGEST TIRE MAKERS IN THE WORLD

CYCLE SPORT AND TRADE.

meet the requirements it remains a true circle and the teeth are never out of pitch.

In Fig. 1 the device is shown fitted to an ordinary bicycle of a well-known English make. In Fig. 2 is shown a view of the side of the gear, toward the frame, with the sprocket set at the small size or low gear. Fig. 3 shows a view from the same



point with the sprocket expanded.

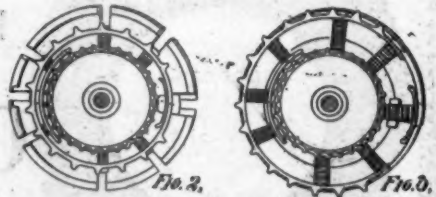
The system of operation embodies several mechanical ideas never before attempted in this direction. A spiral screw, as in a three-jaw chuck, at the back of Fig. 2 holds a flange on the spring tempered sprocket-ring in a vice-like grip, and as the gear wheel, shown in the center of the disk, is rotated, it acts on the sections of the spiral screw, moving them inwardly or outwardly according to the direction in which the gear is rotated. The back plate, or disk containing the radial slots, in which the sections of the screws are seated, is in rigid connection with the crank-shaft and turns with it, while the gear is rotatably seated on a hub of the disk. On the back of this gear is a spiral screw which engages the teeth of the sections seated in the disk and when the gear and disk are moved in a rotary direction, in relation to each other, serves to move them in a radial direction in the slots, carrying with them the sprocket-ring, which is thus varied in size.

To rotate the gear-wheel there is attached to the rear fork a pawl with two arms, one of which projects upward to engage the top of the gear, and the other downward to engage the bottom thereof. This pawl is actuated by a wire extending to a thumb lever, conveniently placed on the handle-bar, and when it is desired to change the gear this pawl is so moved that the required end will conjoin with the teeth of the gear-wheel, thus momentarily holding that member stationary, while the disk continues its revolutions; and the threaded

sections holding the sprocket-ring are moved in a radial direction. When the gear has been rotated in relation to the disk to the proper degree, the pawl is automatically disconnected from the teeth of the gear-wheel, which is then free to move with the disk. There are 16 teeth in the sprocket-ring and, when set for the low gear, as shown in Fig. 2, they form a complete circuit, the loose ends resting on an arc supported by the screw section on the extreme right of the drawings by means similar to that employed in supporting the sprocket-ring.

In Fig. 3 the sprocket is shown completely enlarged and locked in position for the high gear. In this position the ends of the ring are separated by a considerable interval, which is practically bridged by the above mentioned arc, which has been moved radially during the extension of the sprocket so that it now lies with its face on a line concentric with the sprocket and acts as a seat for the chain at this point. Of course there are no teeth here, but there will still be, at all times, an abundance of teeth in contact with the chain to take the strain. In order to take up the slack in the chain, unavoidable at low gear, an idler is used, attached to a light bamboo arm supplied with a spring which holds it in proper position.

This device is certainly simple and could be made quite inexpensively, and as pat-



ents have been applied for in the United States, it is not unlikely that an attempt will be made to introduce it here, though the American rider is not as much inclined toward appliances of this nature as is the European.

Records at Vailsburg

New York, Aug. 26.—Seven thousand spectators welcomed the crack professionals back to Vailsburg yesterday, they and the management having reached a satisfactory settlement. Sensational racing marked their return and kindled anew the fire of enthusi-

While They Last

FIVE (Milwaukee style) racing bodies. Piano finished in black and green (also red) each **\$50.00**

FIVE angle iron frames for body to rest on (with springs) - - - - - **\$17.00**

FOUR sets wood wheels (best made) 30-inch by 34-inch for 3-inch tires, per set - **\$17.50**

SIX Carbureters (French pattern float feed) each - - - - - **\$16.00**

FIVE double cylinder upright (5 h. p.) motors 9 R. P. M. Finest of material and workmanship each - - - - - **\$150**

ONE complete vehicle, ready to run. French style in appearance. (Weight about 1300.) **\$500**

ONE unfinished carriage, complete less motor and accessories (with \$60.00 tires) a great bargain - - - - - **\$300**

These parts and machines are of the best in every particular and are on sale owing to the illness of the maker which necessitates his withdrawal from business.

We will sell all or any part. Prices are net and spot cash. F. O. B. Chicago.

Will sell all patterns, drawings, etc., necessary to start the building of gasoline machines at half their original cost.

We still sell **Dasey Plugs**, Dow Coils, Batteries, Etc., as well as Apple igniting Dynamos and a full line of supplies. Write for prices to

THE P. J. DASEY COMPANY

160-162 Washington Street,

CHICAGO

CYCLE SPORT AND TRADE

asm in the greatest cycle racing town in the country.

The open half was run in championship style and narrowed down to a match between Kramer and Lawson in the final. Lawson was in the lead in the jump and Kramer could not get by him. The Chicagoan rode the last eighth in 12 seconds.

Record riding, however, almost overshadowed the Lawson-Kramer battle. Fenn accomplished the wonderful feat of knocking over 12 seconds off his own world's record in the 5-mile handicap. At 3 miles Kramer quit and Fenn went in alone, catching the bunch at 3 miles. The others tried to run him off his feet, but he worked through the field of 35 and led at the bell. He made the running all the way the last lap and romped home six lengths in advance in the marvelous time of 10:15, an average of 2.03 for the mile.

The 2-mile amateur handicap was also a record-breaking contest, in which Chas. McConnell, of Boston, made figures that will probably stand. There was a close finish between him and L. R. Lake (90). The judge who picked first insisted on Lake as the winner, though the other judges and spectators declared McConnell won. The time was 4:00, which is but a fifth of a second behind Kramer's world's record of 3:59 4-5 for professionals. As the men were only inches apart, both really scored the time whichever won, and the record may be allowed. The former record was 4:12 4-5, made by Ingraham at Buffalo. If the record is not allowed McConnell will be the second to suffer in this way at Vailsburg, as Harry Welsing lost a 10:12 2-5 record for 5 miles by his time not being taken. Lake (15) won the quarter-mile handicap in 31 1-5, with Schreiber (scratch) second and Losee (10) third.

Monday's Racing at Madison Square

New York, Aug. 24.—The national circuit racing at Madison Square Garden last night was replete with sensations. Kramer was overthrown in a trial heat, and Gascoyne, the Englishman, riding hard from start to finish, qualified in his trial and first semi-trial heats and outrode Collett in the grand semi-final, though Lawson was too strong for him in the final.

Cooper took the lead in the trial heat, and half way along Kramer went to the

front. Collett then made play and took the pole. When Kramer made his effort he failed to get by on the turn and Cooper cut in on the inside and shut him out.

Lawson and Fisher and Gascoyne and Collett emerged in safety from the first semi-finals. In the grand semi-finals Lawson, who was full of running, easily disposed of Fisher and Gascoyne, spurring the entire half, would not let Collett go by him.

In the final Gascoyne tried to run away with Lawson, but the Chicagoan in the third lap passed him like a whirlwind and scored another championship four points.

Leander rode a grand race in the 2:10 class, and put himself out of it by winning it in 2:09 2-5. Ross was second and Bell third.

Terrific going marked the trials and final of both the amateur and professional mile handicaps. Fenn (scratch) won a trial heat in 1:59 1-5 and captured the final in 2:00; Rutz (80) was second, Fisher, (20) third and Stevens (80) a fourth. The mile amateur handicap was an equally fast and stubborn contest. Brooks (35) was the winner in 2:00, exactly the same time as scored by the money chasers. The order of the others was Egloff (80), McClelland (60), Anderson (120).

Schreiber, the best of the Garden amateurs, as usual, won the half-mile open. Courtes was second and Lake third.

The Boston vs. New York team race was a stubborn fight. The conditions were mile heats, best two in three, with points counting four, three, two, one in each. Hurley and Schreiber rode for New York and McConnell and Mettling were the Bean-eaters. Hurley and Schreiber won first and second in the first heat, but Hurley was set back to last place for running McConnell up the bank. The order in the second heat was Hurley, Mettling, Schreiber, McConnell. This gave New York the heat, 6 to 4. Boston won the third heat, 6 to 4, the order being McConnell, Schreiber, Mettling, Hurley. Boston refused to ride off the tie, and the race was given to New York.

Standing of the Men

New York, Aug. 26.—Major Taylor was absent from the national circuit all of last week except Monday, alleging sickness as the result of his collision at the Garden

ADVERTISEMENTS.

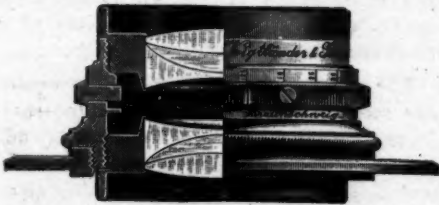
that night. This and Iver Lawson's victory on Friday night, when Kramer was shut out in the first heat, have put the Chicagoan and the Orangeman in the lead. Lawson is becoming dangerous. His victory at the Garden Friday night was followed by a brilliant defeat of Kramer at Vailsburg yesterday under championship conditions. Fisher, another Chicagoan, has jumped the next bunch and is now in fourth place.

The score at the close of last week's racing was: Kramer, 56; Lawson, 30; Taylor, 27; Fisher, 17; Cooper, 14; Fenn, 13; Freeman, 8; Collett and Gascoyne, 7 each; McFarland and Kimble, 5 each; Hausman, Butler and Newhouse, 1 each.

Records for Walthour

New York, Aug. 26.—Walthour established a new indoor record table for 15 miles at Madison Square Garden to-night and incidentally beat Nelson a mile and a half. The Swede had hard luck, losing two laps early in the race by a forced change of mount and four laps in the last mile through his motor going wrong. It was a great race at the start, which was a flying one. After a lap or two of side by side riding Wal-

A Hint to TOURISTS



In your **cross country** runs thousands of interesting points are made.

Have you your camera with you?

Is it modernized and up to date?

If so, it should have a COLLINEAR Lens, the quickest and most perfect anastigmat. Used by the **foremost sportsmen** and the most **experienced travelers**. Can be fitted to any camera. For particulars write for catalogue "T."

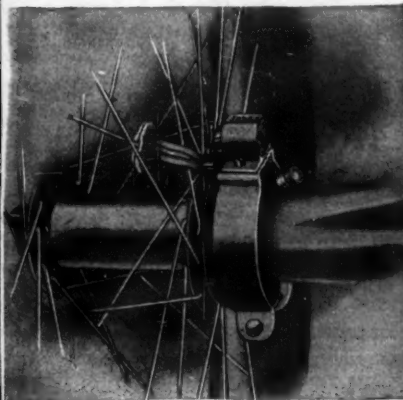
THE VOIGTLAENDER & SON OPTICAL CO.

137 West 25th Street, NEW YORK.

When buying an Automobile see if it is equipped with a

VEEDER ODOMETER

If it is you may feel reasonably certain that its manufacturer pays careful attention to detail and it is a guarantee that he is not exaggerating the efficiency of his motor power or over-estimating his fuel capacity.



Odometer with band bracket Price **\$3.50**

The following leading automobile manufacturers have adopted the Veeder Odometer and offer it as a regular equipment without extra charge.

The Locomobile Co. of America, Bridgeport, Conn. The National Automobile & Electric Co., Indianapolis, Ind. The De Dion-Bouton Motorette Co., Brooklyn, N.Y. The St. Louis Motor Carriage Co., St. Louis, Mo. Milwaukee Automobile Co., Milwaukee, Wis. Electric Vehicle Co., Hartford, Conn. (Gasoline Carriages.) Rochester Cycle Mfg. Co., Rochester, N.Y. The Steamobile Co., Keene, N.H. Knox Automobile Co., Springfield, Mass. Buffalo Electric Carriage Co., Buffalo, N.Y. Foster Automobile Co., Rochester, N.Y. The Kidder Motor Vehicle Co., New Haven, Conn. The Beardsley & Hubbs Mfg. Co., Mansfield, Ohio. The Aultman Co., Canton, Ohio.



**The Veeder
Mfg. Co.**

HARTFORD, CONN.

Makers of
Odometers,
Cyclometers,
Counters,
Fine Castings.

Odometer, only price \$3.00

Made for 24, 26, 28, 30, 32, 34, 36, 38, 40, 41, 42, 44, 46, 48, and 50 in. wheels.
16-page catalogue free.

CYCLE SPORT AND TRADE

tham took the lead, but it was a mile and seven laps, during which Nelson changed motors, before he could lap him. Walthour rode the first mile in 1:37 2-5 and the fifteen in 24:19 3-5, as against the old record of 25:42 2-5.

Great Prize of Copenhagen

Six thousand people crowded the velodrome of the Danish city on Aug. 11 and 13. The sport was defective on account of the dangerous track. Ellegaard alone had nerve to take it at full speed, thus winning everything. With Eros, Ferrari and Seidl the world's champion started in the final of the Grand Prix. In one of the turns Seidl touched the track with his pedal in the turn and Eros and Ferraro who followed him fell, while Ellegaard, who had escaped, ran away, and won. With Arend as teammate he won the tandem race.

The second day's meeting was again all for the Danish champion, who won the final of the scratch race by twenty lengths from Heller and Huber.

The championships of Holland were run on the new Amsterdam track on Aug. 4. Schilling won the professional and Gelderman the amateur. Dickentman won the long distance championship.

Miller Finally Wins

On Aug. 10 and 11 a two-days' race, six hours each day, was run in Tours, France, and won by Charles Miller. The first and last hours were paced. Eleven riders took part. Miller was paced by a tandem, while Simar had a big tricycle. Miller gained rapidly. At the end of the first hour Miller was first with 54 kilometers 200 to his credit. Nothing exceptional occurred during the remainder of the day and at the end

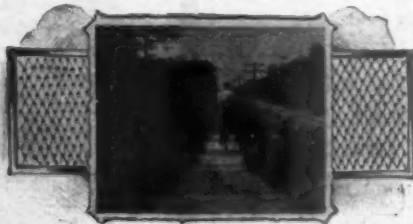
Miller was leading with 197 kilo, 200 meters, Simar 3 kilometers behind. During the second day nothing happened until the last hour. Twenty minutes before the finish Miller's tandem broke down and poor Charley tried to follow Simar, but the pace was too hot and before another machine was brought into action he had lost seven laps. Finally Germain, another rider in the race, ordered his pacing machines to help Miller. This was well received by the crowd and a fine chase followed. Miller rapidly gained, while Simar showed fatigue. Suddenly, and less than 2,000 meters from the end, Simar fell off his machine, broken down. Miller finished in fine condition, having covered a total of 382 kilometers 800 meters. Simar was second and Lorgeou third.

Changes at Motsinger's

The Motsinger Device Co. recently declared a dividend of 8 per cent. Since that time the stock held by Will and Robert A. Morris, treasurer and secretary, respectively, has been sold to Homer Motsinger. N. H. Motsinger, president, is in Europe, and has cabled that the English rights have been sold.

The city fathers of South Bend have instructed the proper officer to communicate with the Milwaukee Automobile Co. and endeavor to interest its management in the attractive points of the city as a manufacturing center.

The Cincinnati Panel Co., Cincinnati, has recently issued a new illustrated catalogue, showing its standard line of fine carriage wood work. In this are shown several designs of carriage bodies applicable to automobile use.



ADVERTISEMENTS.

Used by Railroad Company

Recognition of the value of the automobile, says the London Express, is gradually coming in from all quarters. Even a railway company has pressed motor-cars into its service. The Great Western Railway Company has a line to Cardigan and another to Newcastle Emlyn, but no means of bridging the two towns, although they are but 10 miles apart. The company, therefore, proposes to establish an auto-car service between the places named, and there is no doubt that this would be a boon, as it would considerably shorten the at present circuitous journey to Cardigan.

MISCELLANEOUS

Advertisements under this head 5 cents per word first insertion; 3 cents per word each insertion thereafter. Cash with order. Express orders, postoffice orders or stamps received.

FOR SALE

FOR SALE—Automobile (Winton) surrey, used one season, in first-class condition. Reason for selling, want faster machine. Address W. H. LAUGHLIN, Canton, O. 3

FOR SALE—The Automobile Storage and Repair Co., 57 West 86th St., New York, have new and second-hand steam, gasoline, and electric carriages constantly on hand and have always some special bargains. *

FOR SALE—Winton automobile, fall 1900 model, in good order, \$800. Will teach purchaser to operate and accompany him home. F. E. LOW, Stuebenville, Ohio.

NO. 2 LOCOMOBILE, first-class condition \$485.00; No. 2 Locomobile, almost new, been run 75 miles, \$650.00; brand new "Locosurrey," \$1,075; Orient quad, \$300. I personally guarantee all the above. In stock ready for immediate shipment. A. L. DYKE, Auto Supplies, office Linmar Bldg., St. Louis, Mo. *

TWO BARGAINS—One of our model No. 1 carriages used but a few miles for demonstration purposes. One model No. 2 Locomobile with brand new, latest style engine, new compensating gear and many improvements. Write us for prices on these and we will surprise you. LOOMIS AUTOMOBILE CO., Westfield, Mass. 1

WANTED

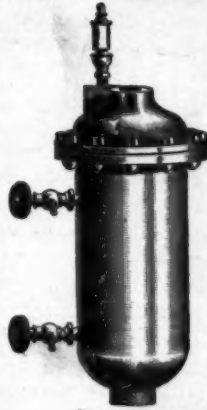
AGENT WANTED to purchase second-hand bicycles. Address INTERNATIONAL BICYCLE CO., Shanghai, China. 10

WANTED—Complete fittings, including engine for building motor bicycles and cars. Quote lowest prices and send drawings and particulars at once. Must be cheap. IMPERIAL CYCLE AND MOTOR CO., Upper Trinity Street, Birmingham, England. 2

WANTED—A competent superintendent who is connected for a long time with a leading steam carriage maker is open for an engagement. Can design and construct any kind of engine or motor and owns some patents in that direction. The best of references as to ability and conduct given and will be ready to take a position at short notice in any part of the country. Address, "SUPERINTENDENT," care of Motor Age, 150 Nassau Street, New York. 1

RELiance SAFETY WATER COLUMN

"Low Water Alarm for Steam Carriages"



Low Water in the boiler of a Steam Vehicle is particularly dangerous and expensive.

The Reliance alarm is light, strong, and easily attached. It gives the alarm before the water gets too low. Made on the same principle as the celebrated Reliance Safety Water Columns, for stationary boilers, that have been on the market for 14 years, and of which there are over 35,000 in daily use. When you buy a new steam vehicle, insist that the boiler shall be protected by a Reliance Low Water Alarm.

SAFE! SURE! SUCCESSFUL!

Bank of summer Summer, Iowa, Feb. 25, 1901.
THE RELIANCE GAUGE COLUMN CO., Cleveland, O.

GENTLEMEN:—In reply to your favor of the 22d inst, asking how I liked my Low Water Alarm sent me a few days ago, I beg to advise that the same is working entirely satisfactory. I have attached it to my "Locomobile" under the seat and between the engine's muffler and the boiler. I find the space just large enough and the main braces of the carriage are just right to support the Column nicely. I have tested it in various ways and find that it will always give the alarm just as the water leaves the bottom gauge cock in my water column. I consider the alarm very substantially made, and it would seem there is nothing to get out of order or cause trouble. There is no doubt in my mind that it will save my boiler a scorching sometime in the future. Yours very truly,

Signed, J. F. CARR, Vice Pres.

RELIANCE GAUGE COLUMN CO., Sole Mfrs.
Write for prices. 65 E. Prospect St., Cleveland, Ohio.
CHICAGO OFFICE, 79 LAKE STREET.

Catalogue Department

THE MOTOR AGE has established a catalogue department and will forward the catalogues of any or all advertisers on request.

The objects of this department are as follows:

1. To save the reader the trouble and expense of writing to each individual concern whose catalogue he may need.
2. To place advertisers in direct communication with prospective purchasers.

Applicants for catalogues will please state specifically the names of the concerns whose catalogues they desire and enclose stamps to cover postage.

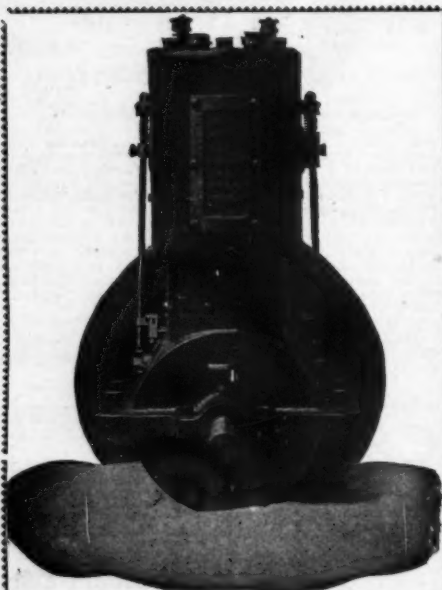
Applications should be addressed to the Catalogue Department, MOTOR AGE, Monon Building, Chicago.



Steel Balls . . .

BEST IN THE WORLD

Excelsior Machine Company
BUFFALO, N. Y.

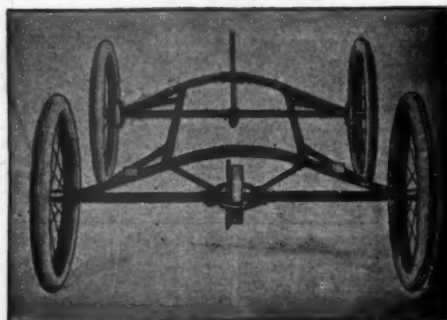


Not a foreign reproduction.

GRANT-FERRIS COMPANY

MAKERS
HOWARD HYDRO-CARBON MOTOR
TROY, N. Y.

GEARS



We are prepared to furnish gears complete on short notice; also frame fittings rough or machined, and solicit quantity orders. Material and workmanship of the highest order.

THE CONRAD MOTOR CARRIAGE CO.
Dewitt & Bradley Sts., BUFFALO, N. Y.

A BIT OF SENSE



"There is no such thing as a practical indestructible Plug" are the words used by a competitor of ours who is trying to convince the public that a cheap porcelain spark plug is the equal of our **Mica Core**. Now we will ask the reader to use **A Bit of Sense** and tell us why if such is the case, this party does not come out as we do and guarantee his plugs against breaking down for three months. Simply because he can't do it and **we can**. Now use your bit of sense and compare the two materials from which these plugs are composed. **Porcelain** and **Mica** and you will at once see the reason. Heat, expansion and electric current have no effect on our **Mica Core**. Thus our claim for an indestructible Plug. If you want the **very best ignition outfit made** in this country, we can supply you. If you want experiments try some of the others. Write for catalogue.

AMERICAN COIL CO., 30 NEWTON STREET, WEST SOMERVILLE, MASS.
New York Representative, Henry R. Teepe, 15 Cortlandt Street.

Dyke's Float Feed Carburetor



Is acknowledged to be the best carburetor that money can buy.

It gives more power because it gives a proper mixture. Suitable for engines from 8 to 20 H. P. We make a special one for engines up to 50 h. p., also used for boat

and stationary engines.

Guaranteed to give satisfaction or your money refunded. Send stamp for new printed matter. Gasoline engines from 8 to 10 H. P. Running Gears, Automobile Supplies, Etc.

A. L. DYKE, Manufacturer,

Vanveener & Washington Sts., :: ST LOUIS, MO.

PAN-AMERICAN STORAGE

:: : STATION :: : :

SUPPLIES AND EXPERT REPAIRS.

Visiting Automobilists to Buffalo can depend on safe and courteous treatment. Fine residence neighborhood. Within a block of the Buffalo Automobile Club, and central. Can accommodate 100 Autos. Charging station and all conveniences for all styles. Charges moderate. Correspondence solicited. :: : : : : : : : : : : :

Official Automobile Blue Book Station.

THE AUTOMOBILE STORAGE, INSPECTION & REPAIR STATION, 303 North St., Buffalo, N. Y.

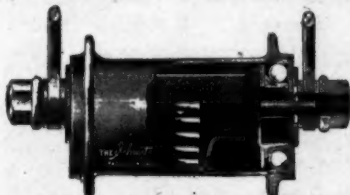
Gasoline Motor Castings

Of 4 inch x 4 inch motor, described in Motor Age, \$48 with Blue Prints. Also Marine and Bicycle Motors.

LOWELL MODEL CO.

P. O. Box 292 - LOWELL, MASS.

FIRST TIME PRIZE



Pullman
Road Race
July 4, 1901
Won on this
HUB

Won First Time Prize May 30th, 1901, in Century Road Race. Reduced record, which stood for 4 years, by 30 minutes.

Substantiates our claims, doesn't it? For full particulars address

F. SCHMITZ & SONS, 560-564 Orleans Street, CHICAGO

THE RACYCLE

THE PERFECT WHEEL.

Seven models, with a range of prices to suit all purses. Write us.

THE MIAMI CYCLE & MFG. CO.,

Middletown, Ohio.

FENDERS

We can quote a very interesting price on automobile fenders. Write us for

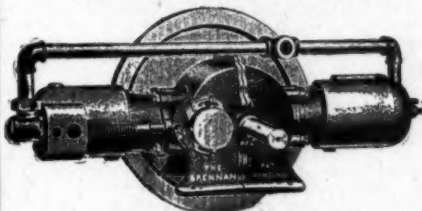
AUTOMOBILE SUPPLIES

Eastern Automobile & Supply Co.

67-71 Fountain Street,

Providence, R. I.

The BRENNAN WATER-COOLED MOTOR ..



Manufactured 4, 5 and 7 H. P.

BRENNAN MFG. CO., SYRACUSE, N. Y.

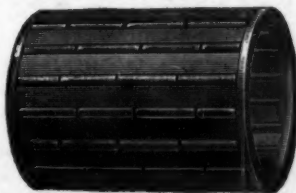
THE ROLLER BEARING

W. S. Rogers (Late Mng'r. Ball Bearing Co., of Boston) KEENE, N. H. Vice Pres.

MOTOR VEHICLE BEARINGS

FOR MOTOR VEHICLES

GET OUR CAT.



IT TELLS ALL.

THE BALL BEARING CO.

BOSTON, MASS.

AUTOMOBILES

WHAT ARE THEY AND WHAT WILL THEY DO ?

THE MOTOR AGE

THE AUTOMOBILE AUTHORITY IN AMERICA

124 BATTERY STREET CHICAGO

ADVERTISEMENTS.

ESTABLISHED 1849.

== CARPETS ==

C. COLES DUSENBURY & SON, Agents, 396-398 BROADWAY, cor. Walker St., NEW YORK.

AGENTS FOR CLOTH MILLS

Visitors to Pan-American Should Stop At

Park Inn

1392 Amherst St., Buffalo. (Opposite Park Meadow.)

Beautifully situated in a grove of native oaks bordering on the extensive Meadow of Delaware Park. This is a fine modern residence, with large grounds lately occupied by the Country Club and fitted up by them, with extensive Kitchen and Porches, Porch and interior dining rooms. A thoroughly good Cuisine is a prominent feature of the restaurant.

A few large rooms en suite, large closets, baths, etc., (sanitary plumbing) also single rooms, are now ready for guests. Special rates made to long time guests.

By accurate measurement, PARK INN is but $\frac{1}{4}$ of a mile east of Amherst St. and Delaware Ave. gate (east gate) of the Exposition grounds. The south side of Amherst street is formed by Delaware Park, thus making a delightful walk to and from the grounds.

Trolley cars running direct from Railroad Stations to the Exposition grounds pass within five hundred feet of the INN. The N. Y. C. Belt Line trains are within two blocks of the INN.

Take Main-St.-Pan-American, or Jefferson St. cars to Parkside Avenue and Amherst Street, or N. Y. C. Belt Line to Parkside Station. (Ask for "Belt" that stops there), and walk two blocks south to Amherst Street.

We have a building on our premises which will accommodate twenty Automobiles

JOHN C. DUNHAM, Manager.

Parts at a Bargain....

The advertiser offers for sale at about 40 per cent below cost the following

NEW GOODS

which were purchased for experimental purposes only:

Two 15x15 boilers, with steam superheaters, each	\$60 00
One 15-inch Milne burner with pilot light	25 00
Two water-level regulators, each	10 00
Two Locke fuel regulators, each	3 50
Two sets glass fittings, set	3 50
Two injectors, each	3 00
Two sets air and steam gauges, set	3 00
Two 6-inch gongs	3 50
Three sets water tanks, set	5 00
One 19-inch boiler and burner	150 00

All in splendid condition. Can be seen at any time in Chicago.

Address STEAMFITTINGS,

Care of MOTOR AGE, Monon Building, CHICAGO.

• BUFFALO'S MOST LUXURIOUS HOTEL •

The Lenox

North St., Near Delaware Ave.

ABSOLUTELY FIREPROOF.

Located in the most aristocratic section of the city, and of all permanent hotels is nearest to the **Pan-American Exposition**. A strictly high-class and thoroughly modern hotel, conducted for those who want the best.

EUROPEAN PLAN.

GEORGE DUCHSCHERER - - PROPRIETOR.

Headquarters: BUFFALO AUTOMOBILE CLUB.



IF YOU WANT CATALOGUES

Of any of the advertisers in this paper
write to :: :: :: :: ::

THE MOTOR AGE

Monon Building, CHICAGO

Dietz Automobile Lamp

Burns kerosene 24 hours with one filling. A simple, efficient Lamp giving a fine light and which can be depended on to stay alight in spite of wind and jar. Especially suited for touring.

R. E. DIETZ COMPANY, - 37 Laight St., New York

Become Posted..

ALL WELL POSTED PERSONS
... SAY ...

.. The Harris Hubs ..

DO WHAT NO OTHERS
... CAN ...

E. T. HARRIS

535 W. 15th St. : : CHICAGO.



A R B ROLLER BEARINGS

If you are not using the A R B you are not getting the greatest possible efficiency from your machine.

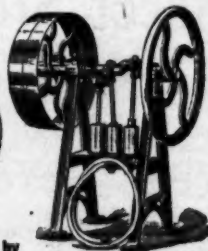
Send for circular.

AMERICAN ROLLER BEARING CO.
Boston, - - Mass.

Western Dept.
K. Franklin Peterson
165 Lake St.
CHICAGO, - - ILL.

AIR PUMPS, TANKS, GAUGES AND AIR FITTINGS

For Users and Makers
of Automobiles and
Pneumatic Tired Wagons



Manufactured by

GLEASON-PETERS AIR PUMP CO.

20 West Houston St., NEW YORK, U. S. A.

The popularity of the **OLDSMOBILE** has become so marked, that we take this opportunity to notify all imitators and infringers that, while our motor is covered by our engine and designed patents, we have a number of applications for patent upon the mechanical improvements in our device, which are allowed, covering nearly every part of the machine.

Safe for child to operate.



We have separate catalogues for Stationary and Portable Engines.

FULLY GUARANTEED.

OLDS MOTOR WORKS

50 Concord Ave.,

DETROIT, MICH

THE MARSH MOTO CYCLE LEADS THEM ALL.

If you want to be in the front row in the Motor Cycle business, write at once and secure the agency for the Marsh. We want live, hustling agents in every part of the U. S.

PRICE \$200 Immediate delivery. Write for our new catalogue and terms to agents.

Motor Cycle Mfg. Co. - Brockton, Mass.

20th Century OIL AND GAS Bicycle, Driving and Automobile HEAD-LIGHTS

For sale by ALL JOBBERS AND DEALERS
20th Century Brand of Carbide.

CREST MANUFACTURING CO. CAMBRIDGEPORT, MASS.



MANUFACTURERS OF
CREST GASOLINE
MOTORS,
CREST
SPARKING PLUGS



EVERYTHING
FOR AN
AUTOMOBILE.

ADVERTISEMENTS.



Dyke Jump Spark Coll - \$8.50
Dyke Jump Spark Plug .99
A. L. DYKE
Office, Linmar Bldg., St. Louis

Only \$2.98 And Three Hours on the
EMPIRE STATE EXPRESS
PAN-AMERICAN TO SYRACUSE.
 Don't depend on special exhibition automobiles
 See **The Century** At The Works.

GASOLINE MOTORS

For Bicycles, Launches, Etc. Our 3½ H.P. light Motors for Runabouts. Our Transmission Gear. All parts to build Automobiles, either finished or Castings. Carburetors and Mufflers.
MORGAN MOTOR CO.
 50-54 Columbia Heights, - - - BROOKLYN, N. Y.

STYLISH AND DURABLE

Lamps for Automobiles

GRAY & DAVIS - Mass.
 Amosbury, SEND FOR CATALOG "B"

The Geneva Automobile & Mfg. Co.

GENEVA, OHIO,

Steam Wagons, Running Gears, Engines, Boilers and Parts. Write for prices.

What is doing in AUTOMOBILISM?
 All who are interested in that question should consult the
"Motor-Car World"
 which each month reviews the progress of the new Locomotion throughout the World. Published at 186 Fleet Street, London, England. Annual Subscription, post free to the United States, one dollar.



THE BALDWIN Has been adopted by leading makers,
 ¾ Pitch.
 ¾-in Wide
 Tensile strength
 4,000 lbs.

K. Franklin Peterson, 165 Lake St., Chicago, Ill.
BALDWIN CHAIN CO., Worcester, Mass.

DIXON'S No. 635 GRAPHITE

is the best form of graphite for lubricating engine slides and cross-heads of steam motors, and for lubricating cylinders of both steam and gasoline motors : : :

Joseph Dixon Crucible Co., Jersey City, N. J.

BUFFALO PAN-AMERICAN

Automobilists coming here arrange ahead with us for storage, supplies, repairs. Splendid location. Efficient service. Agents for new and second-hand automobiles. Will consider representation for good concerns.

BUFFALO AUTOMOBILE EXCHANGE
 1097 Ellicott Square :: :: 320 Franklin Street

THE CROSBY COMPANY
 BUFFALO, N. Y.

SHEET METAL STAMPINGS

THE WORD Locomobile

Refers to Steam carriages made by the **LOCOMOBILE COMPANY OF AMERICA** only. It is a trade mark. :: ::

7 East 42nd Street, :: :: :: NEW YORK

There is no **SUCCESS** like

KEATING MOTOR BICYCLE SUCCESS

KEATING WHEEL & AUTOMOBILE CO.
 MIDDLETOWN, CONN.

MILLER ROLLER BOILER • • • •

• • • • TUBE EXPANDER

For expanding ¾-in. Copper Boiler Flues in Automobile boilers. \$4.00 Each.

97-99-101 • **CHAS. E. MILLER,** New York
 Reade Street. City . .

MODERN CYCLE REPAIRS

ONE DOLLAR TO CYCLE AGE
 OR MOTOR AGE SUBSCRIBERS

THE CYCLE AGE - CHICAGO

Sheet Steel Parts

— FOR —

Bicycles and Automobiles. Special stampings made from drawings or blue prints, all of a superior quality. Send for Catalogue.

THE H. A. MATTHEWS MFG. CO., Seymour, Conn., U. S. A.

THE MOTOR WORLD

Devoted to the Automobile and Kindred Interests.

NOT LIKE THE OTHERS

It's readable and you can understand what you read

PUBLISHED EVERY THURSDAY AT
 123-125 TRIBUNE BUILDING, - NEW YORK
 \$2 Per Year. Sample copies gratis.

Yellowstone Park...

Extended tour, leisurely itinerary with long stops in the Park. Private coaches for exclusive use on the drive. Pullman sleeping and dining cars. Established limit to number going. Escort of the American Tourist Association, Reau Campbell, General Manager, 1423 Marquette Building, Chicago. Colorado and Alaska tours also.

Tickets Include all Expenses Everywhere.

Train leaves Chicago via Chicago, Milwaukee & St. Paul R'y., Tuesday, July 9, 10:00 p. m.

NEW WABASH EQUIPMENT.

The Wabash Railroad has just received and placed in service on its lines running out of Chicago the following new equipment:

Eight combination baggage and passenger coaches, thirty palace day coaches, ten reclining chair cars, three cafe cars and two dining cars. The majority of these new cars are seventy feet in length, and fitted with the latest style wide vestibules. They have six-wheel trucks with steel wheels. The cars are finished in the finest selected Jago mahogany. The lighting is by Pintsch gas with the exception of the cafe, dining and some of the chair cars, which are unusually well lighted by electricity, the fixtures being especially designed for these cars. The dining cars will seat twenty-nine persons and have ample kitchen space. The cafe cars will seat eighteen persons in the cafe, and have a library and smoking room in the observation end of the car which will seat fourteen persons. These cars also contain a private cafe with seating capacity for eight persons. These new cars represent the highest stage of the development of modern car building. Nothing has been omitted and no expense spared that would add to their luxurious elegance, or to the comfort and convenience of the patrons of the Wabash road.

No line is now better equipped than the Wabash for handling business to the Pan-American Exposition. Write for a copy of Pan-American folder containing a large colored map of the exposition grounds and zinc etching of the principal buildings.

F. A. PALMER,

Asst. Gen. Pass. Agt., Chicago, Ill.

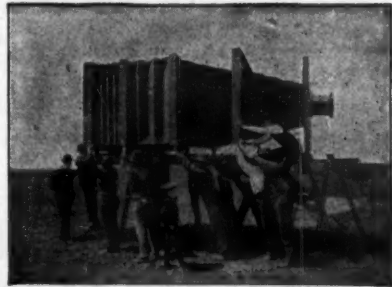
Faster than ever to California

CHICAGO & NORTH-WESTERN RAILWAY

THE OVERLAND LIMITED leaves Chicago 6:30 p. m. daily via Chicago-Union Pacific and North-Western Line, arrives San Francisco afternoon of third day and Los Angeles next morning. No change of cars; all meals in Dining Cars. The Pacific Express leaves 10:30 p. m. daily. Personally conducted excursions every Thursday from Chicago and every Wednesday from New England. Inquire of any ticket agent or address

461 Broadway, New York; 601 Chestnut Street, Philadelphia; 368 Washington Street, Boston; 301 Main Street, Buffalo; 212 Clark Street, Chicago; 435 Vine Street, Cincinnati; 507 Smithfield St., Pittsburg; 234 Superior Street, Cleveland; 17 Campus-Martius, Detroit; 2 King Street, East Toronto, Ont.

LARGEST CAMERA IN THE WORLD



WAS CONSTRUCTED ESPECIALLY
BY ORDER OF THE

CHICAGO & ALTON

RAILWAY, TO PHOTOGRAPH
THE ALTON LIMITED.
SEND A 2c. STAMP TO GEO. J. CHARLTON,
G. F. A. C. & A. RAILWAY, CHICAGO, ILL.,
AND RECEIVE AN ILLUSTRATED PAM-
PHLET WITH FULL ACCOUNT OF THE
FIRST EXPOSURE MADE WITH THE EX-
TRAORDINARY MACHINE.

THE Locomotor Steam Carriage

IMMEDIATE DELIVERY



The following improvements will be appreciated by automobile purchasers: Low water alarm; four bearing engine entirely enclosed running in oil; extra heavy side steer; hand auxiliary pump; air pressure pump; auxiliary throttle; stop for brake lever; double acting brake; feed water heater; electric illuminator for gauges and water glass; heavy frame; roller bearings on rear axle; 30-inch wheels; option on tires, etc., etc.; Kelly Handle Bar generator attached to all vehicles without extra charge. Of the large number of our vehicles in daily use, not one has ever had the boiler scorched.

RUNABOUTS, STANHOPES, CONVERTIBLE TOURING CARTS,
DELIVERY WAGONS.

RECEIVERS BALDWIN AUTO. MFG. CO.,

Connellsville, Pa.

DE DION-BOUTON

"Motorette"

COMPANY.

Sole American Agents and Licensed Manufacturers for
DE DION-BOUTON & CO., PUTEAUX, FRANCE

DE DION "MOTORETTES"



ARE THE STANDARD OF THE WORLD

Thousands of Satisfied
Owners say so

Write for additional proof.

De Dion-Bouton
Motorette Co.

Church Lane & 39th St.
Brooklyn, N. Y.

SEE OUR EXHIBIT AT PAN-AMERICAN

1-INCH FITTINGS

FOR FLUSH-JOINT FRAMES

{ Flush head sets with cap nut
Cluster with oval rear lugs
Hanger with oval rear lugs

0UTSIDE JOINT FITTINGS

FOR EXPORT BICYCLES

{ Electrically Welded Head Lugs
Seat Post Bracket with bolt and nut
Cotter Pin Hanger—square cranks

THE CROSBY COMPANY, Buffalo, N. Y.

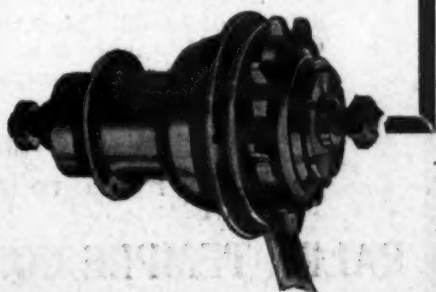
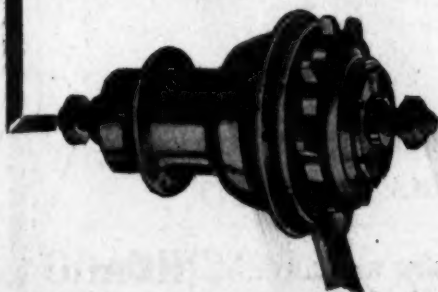
HOW MANY

Un-Morrowized Bicycles

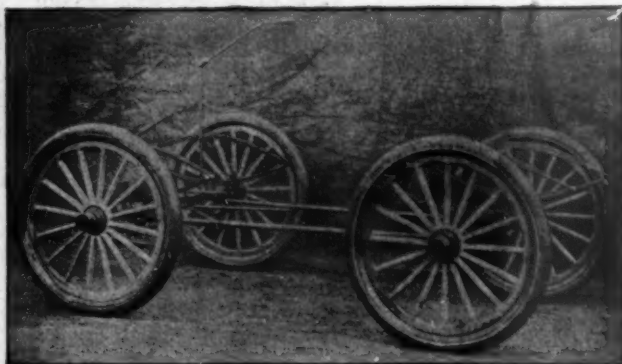
ARE THERE IN YOUR TOWN?

As a matter of fact there is no good reason why every bicycle should not be fitted with a Morrow. Those that remain un-Morrowized constitute evidence that there is work for you to do—work that will add to your profits and to the pleasure of the rider. "Go after" them.

ECLIPSE MFG. CO. :: :: ELMIRA, N. Y.



Automobile Running Gears



Get a running gear that is past the experimental stage and build a **SUCCESSFUL AUTOMOBILE**

We make two styles complete with springs and wood wheels, solid rubber or pneumatic tires.

OUR SPRING BLOCK BEARING IS SELF-ADJUSTING

and you ought to have it. It is made for revolving axles and is pivoted between the bearing and spring block, enabling the bearing to move free and easy with the axle always. Our catalogue tells all about it.

The Brecht Automobile Co. ¹²⁰¹ Cass Avenue, **St. Louis, Mo.**

Satisfaction

PARKSTON, SO. DAKOTA, June 4th 1901.

RALPH TEMPLE CO., Chicago.

DEAR SIR:—I received the last two wheels in good order and have sold them without any trouble. The **FAULTLESS** wheels are the best I have ever seen and is a good all around bicycle. I have enclosed an order for two more **FAULTLESS** bicycles and a draft for the amount of \$25.00. Ship the wheels at once if possible by Chicago, Milwaukee & St. Paul freight.

I remain yours very truly, J. W. BENTNER.

"They Were Shipped the Same Day"

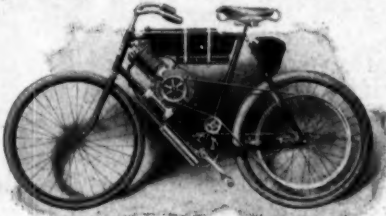
"Our Price to Agents \$12.50"

RALPH TEMPLE CO. 293-295 Wabash Ave., **CHICAGO**

ADVERTISEMENTS.

HE WHO RUNS MAY READ

If you are now running on the old "kick plan"
and wish to improve upon it, inquire about



Mitchell Motor Bicycle

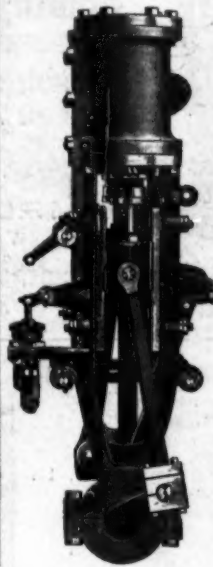
For touring, long or short runs, on the boulevard or in the country, the Mitchell will always be found "there with the goods."

Every part built extra strong; frame of best quality seamless tubing and reinforced where necessary, thus insuring safety.

Every machine guaranteed. Cat. free.

WISCONSIN WHEEL WORKS

Racine Junction, - - - Wisconsin



"THE Locke Improved" No. 1 Engine

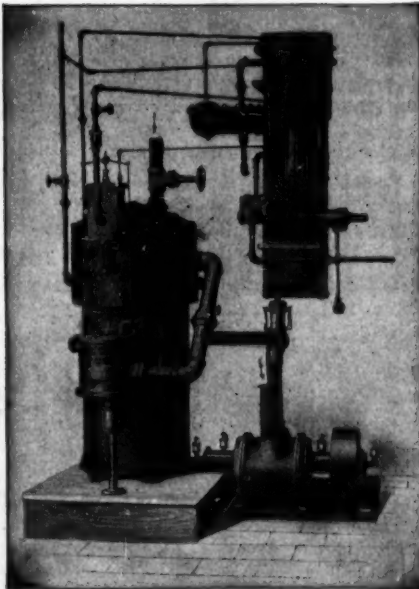
(4½ H. P.)

**MECHANISM SIMPLE AND
SERVICEABLE**

Each engine supplied with heavy asbestos cylinder jackets.

Engines carried in stock. Can be shipped on receipt of order.

LOCKE REGULATOR CO.
SALEM, MASS.



THE Garland

**AUTOMATIC GAS
GENERATING APPARATUS**

FOR AUTOMOBILE FACTORIES

**Any Capacity
Great or Small**

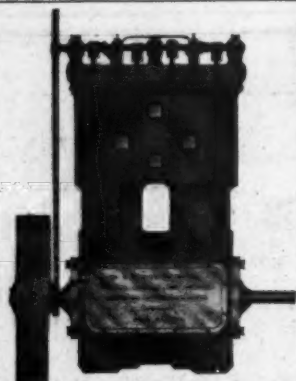
In use in steam laundries with small requirements and packing houses using 300 gallons of gasoline daily.

**Gas of required density without use
of supplementary air blast.
No condensation.
Vaporizes every particle of oil.**

We shall be pleased to figure on the requirements of automobile manufacturers.

GEO. D. GARLAND, - 43 S. Clinton St., - CHICAGO, ILL.

ADVERTISEMENTS.



Remington Standard Motors...

FOR LAUNCHES
FOR AUTO'S

NONE BETTER
FEW COMPARE

A Good Motor with a Good Name

SIMPLE, QUIET, PRACTICAL

REMINGTON AUTOMOBILE & MOTOR CO., - Utica, N. Y.

Write us for catalogue of complete automobiles.

WORLD'S RECORDS

1 mile—1 minute, 22½ seconds
5 miles—7 minutes, 05½ seconds
were made at Buffalo, Saturday, Aug. 17,
on the Stadium track on the



AUTO-BI

with our regular 1½ I. H. P. motor

PREVIOUS RECORDS

1 mile—1 minute, 23½ seconds
5 miles—7 minutes, 10½ seconds
with a motor three times the weight and
rated at double the power. You see we
continue to occupy our regular position as
motor cycle makers—that of leader and the
maker of the best—the AUTO-BI.

E. R. THOMAS MOTOR CO., (Inc.)

103 Broadway - - - - Buffalo, N. Y.

Tire Troubles

arise from cheaply made and
inferior stock. The rubber
used in **FISK TIRES** is the finest
old Para—the fabric is a spec-
ial one used only by our-
selves—the methods em-
ployed in their making are
the highest. :: :: ::
Result: A tire difficult to
equal, impossible to better.

FISK RUBBER CO.

Chicopee Falls, - - - Mass.

BRANCHES:

Springfield; New York; Syracuse; Buffalo;
Detroit; Chicago, 54 State St.
San Francisco, PHIL. B. BEKEART, 114 2nd St.
A. F. SHAPLEIGH HDW. CO., St. Louis, Mo.
Distributors for Central and Southern States.



A Word to the Wise

THIS MEANS YOU, MR. DEALER

INSIST on having MIDGLEY TUBULAR STEEL WHEELS on
all your automobiles. Satisfaction guaranteed. Investigate this
thoroughly. It means money to you. For full particulars

MIDGLEY MFG. CO., - Columbus, O.

Patented October 30, 1900.

Western Sales Office: K. FRANKLIN PETERSON, 105 Lake St. CHICAGO, ILL.

ADVERTISEMENTS.

KOKO TIRE

ARE MANUFACTURED BY
Kokomo Rubber Co.
KOKOMO, IND.

RUSHMORE AUTOMOBILE SEARCH LIGHTS



The only lamp that permits high speed on dark nights. Throws the light 1000 feet ahead of the automobile. For particulars address

THE ADAMS-McMURTRY COMPANY,
114 Fifth Ave. and 7 East 28th St.
NEW YORK CITY



G & J TIRES

FOR AUTOMOBILES

are detachable, double tube tires. An occasional puncture is inevitable in any tire. Any one can repair a G & J Automobile Tire easily and permanently.

G & J TIRE CO.
INDIANAPOLIS, IND.



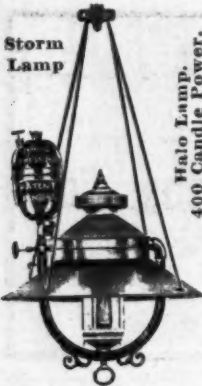
"THE DAYTON" BURNER

(Patent Applied For)

One-piece cast iron Burner. Can't warp or break; will not burn black or blow out. Pilot light burns constantly while carriage is in use. Generator and Pilot Light can be attached to other burners. Send for descriptive circular.

The Dayton Motor Vehicle Co.
1112 East Fifth Street,
DAYTON, OHIO

ADVERTISEMENTS.



Storm
Lamp

Halo Lamp.
400 Candle Power.

Cheaper Than a Candle

AND 100 TIMES MORE LIGHT
... FROM THE ...

Brilliant and Halo Gasoline Gas Lamps

Guaranteed good for any place. Cottage or Mansion,
Store, Church, Factory, Street, Garden, Mine, etc.,
etc. Wherever good and safe light is wanted . . .

OVER 100,000 IN DAILY USE.

Brilliant Gas Lamp Co.,

GEORGE BOHNER.

42 State St., CHICAGO



100 Candle Power.

HUB CUPS

For Automobiles and Carriages

Made by

WORCESTER FERRULE & MFG. CO.

98-100 Beacon St.

WORCESTER, MASS., U. S. A.

WRITE FOR LIST OF SIZES.

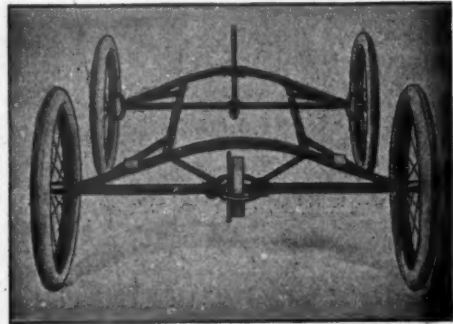
The first in the business to manufacture Sheet
Metal Stampings for Bicycle
Frame Construction.

Established in 1883.

Estimates furnished from blue-prints or sam-
ples, on all kinds of fittings used
in the construction of
Automobiles.

Correspondence Respectfully Solicited.

GEARS



We are prepared to furnish gears
complete on short notice; also
frame fittings rough or machin-
ed, and solicit quantity orders.
Material and workmanship of
the highest order.

THE CONRAD MOTOR CARRIAGE CO.

Dewitt & Bradley Sts., BUFFALO, N. Y.

We have
on hand

50 TONS

of CUPS
CONES
AXLES
SPROCKETS
TUBING
NUTS, BOLTS
SCREWS
FITTINGS

and Repair parts
of all kinds.

Send for List C.

Cleveland Distributing Company

Incorporated.

Jobbers of
BICYCLE AND AUTOMOBILE
MATERIAL

288 Bank Street, Cleveland, Ohio

A black and white photograph of a vintage motorized bicycle. The bicycle features a large, prominent engine mounted on the frame, a fuel tank, and a seat. It has large spoked wheels and a handlebar with grips. The overall design is reminiscent of early 20th-century motor bikes.

Simplest on the market.
SINGLE LEVER CONTROL
Speed variation 4 to 25
miles per hour.

PRICE

\$200

Agents wanted. Write for Catalogue of Motor Cycle and equipment.

MERKEL MFG. CO.,

Dept. A. • • • Milwaukee, Wis.

**Operating a STEAM WAGON should be
a PLEASURE and not a LABOR.**

No More

WATCHING WATER GLASS BURNT-OUT BOILERS KNOCKED-OUT CYLINDER HEADS

With Our

Automatic Electric Boiler Feed Regulator

Two dry batteries operate one year. Simple, durable, easily attached, fully guaranteed. **They Never Fail**

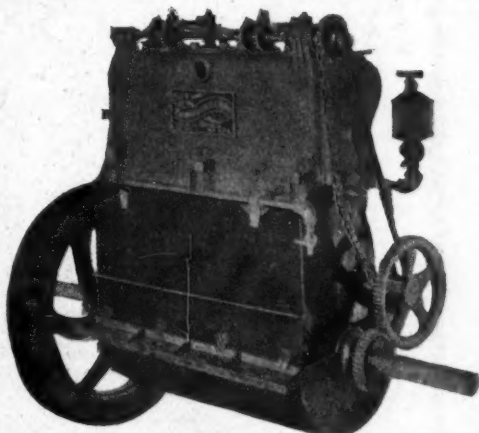
PRICE \$18.00

**THE RELIABLE AUTOMATIC
BOILER FEED COMPANY**

**Room 58, 39-41 Cortlandt St.,
New York.**

AGENTS WANTED

NOT A PUZZLE



Which is the best Engine and Transmission
its easy, its the

BUFFALO GASOLINE MOTOR CO'S

Four cylinder non-vibrating mechanically operated inlet valves, and

EMPIRE GEARLESS TRANSMISSIONS

Only guaranteed transmission made

BUFFALO GASOLINE MOTOR CO.

10-20 Dewitt Street,

Buffalo, N. Y.

[illegible]



HENRI FOURNIER.

French Champion Automobilist, Now in This Country to Participate in International Events.